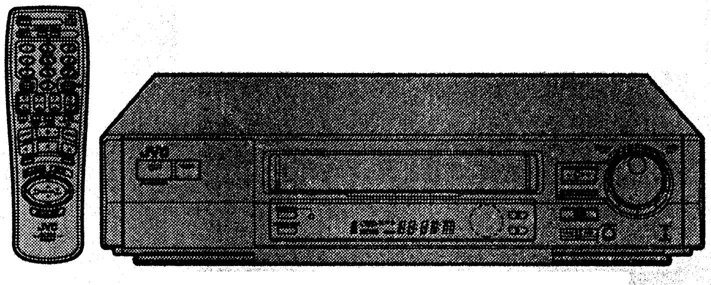
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J248E/E249E



SHOWVIEW VHS PAL

Regarding service information other than these sections, refer to the HR-J245EK/J249EK service manual (No.82587). Also, be sure to note important safety precautions provided in the service manual.

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-E249E)*

GENERAL

Power requirement	: AC 220 – 240 V∿, 50/60 Hz
Power consumption	: 20 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 430 x 94 x 348 mm
Weight	: 4.4 kg
Format	: VHS PAL standard
Maximum recording time	: 240 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal,625 lines 50 fields
Recording system	: Rotary two-head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: 21-pin scart connectors : IN/OUT x 1, IN/DECODER x 1 RCA connectors: VIDEO IN x 1, AUDIO IN x 1

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position "AU")
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF 47 – 89/104 – 300/ 302 – 470MHz UHF 470 – 862MHz
Aerial output	: UHF channels 22 – 69 (Adjustable)
Memory backup time	: Approx. 60 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2

E.& O.E. Design and specifications subject to change without notice.

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No.82593
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The following tables indicate main different points between models HR-J245EK,HR-J248E,HR-J249EK and HR-E249E.

MODEL ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
RECORDING/PLAYBACK SPEED	SP/LP	SP	SP/LP	SP
JOG/SHUTTLE	—	—	○	○
SIDE PANEL	—	—	—	○
FRONT IN	—	—	—	○
3R PICTURE	—	—	○	○
SCENE FINDER	—	—	○	○
AUTO SP/LP TIMER	—	—	○	—
REMOTE CONTROLLER	NON MBR	NON MBR	TV/SAT MBR	TV/SAT MBR
TURBO SEARCH	—	—	○	○

Note : ・Mark ○ is used. ・Mark — is not used

The following tables indicate different parts number between models HR-J245EK,HR-J248E,HR-J249EK and HR-E249E.

PACKING AND ACCESSORY ASSEMBLY<M1>

REF.NO.	MODEL ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
101	PACKING CASE	LP30155-007A	LP30155-011A	LP30155-009A	LY30183-003A
102	CUSHION ASSEMBLY	LP30124-001A	←	LP30124-001A	LY30182-001A
103	POLY BAG	PQM30021-93	←	PQM30021-93	PQM30021-95
106	REMOTE CONTROLLER	LP20106-002B	←	PQ21953U	PQ21953S
106A	BATTERY CAP/COVER	LP40074-001A	←	PQ46614	PQ46614-2
109	SHEET,REMOTE CONTROLLER	PQ35575-1-1	←	PQ35575-1-1	—
⚠ 110	INST BOOK(EN)	LPT0002-055A	LPT0002-097A	LPT0002-056A	LPT0002-058A
⚠	INST BOOK(GE)	—	LPT0002-098A	—	LYT0002-059A
⚠	INST BOOK(FR)	—	LPT0002-099A	—	LYT0002-060A
⚠	INST BOOK(IT)	—	LPT0002-0A1A	—	LYT0002-061A
⚠	INST BOOK(SP)	—	LPT0002-0A2A	—	LYT0002-062A
⚠	INST BOOK(DU)	—	LPT0002-0A3A	—	LYT0002-063A
⚠	INST BOOK(DA)	—	LPT0002-0A4A	—	LYT0002-064A
⚠	INST BOOK(FI)	—	LPT0002-0A5A	—	LYT0002-065A
⚠	INST BOOK(SW)	—	LPT0002-0A6A	—	LYT0002-066A
⚠	INST BOOK(NO)	—	LPT0002-0A7A	—	LYT0002-067A
⚠	INST BOOK(PT)	—	LPT0002-0A8A	—	LYT0002-068A
⚠	INST BOOK(GR)	—	LPT0002-0A9A	—	LYT0002-069A
112	GUARANTY CARD	BT-54003-1	—	BT-54003-1	—
113	E.DISTRI.LIST CARD	BT-20066A	—	BT-20066A	—
114	SHEET(SPAIN)	—	PQ45146-113	—	PQ45146-115
115	POLY BAG	—	QPC02503515P	—	QPC02503515P
116	WARRANTY CARD	—	BT-20135	—	BT-20135
117	POLY BAG, WARRANTY	—	PQ33909	—	PQ33909

Notes : ・Mark — is not used
・Mark ← is same as left

CABINET AND CHASSIS ASSEMBLY<M2>

REF.NO.	MODEL ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
150	FRONT PANEL ASSEMBLY	LP10018-005A	LP10018-007B	LP10018-006A	LP10033-002A
150A	CASSETTE DOOR	PQ21884-41	←	PQ21884-42	PQ21884-35
⚠ 151	TOP COVER	PQ11676-7	←	PQ11676-7	PQ11676-9
152	SCREW,X4(SIDE)	SDSF3010M	←	SDSF3010M	PQ43930
154	KNOB SHUTTLE	—	—	LP30120-001A	LP30120-002A
155	KNOB JOG	—	—	LP30121-001A	LP30121-002A
156	TOP SCREW,JOG/SW	SDSF2608,X2	←	SDSF2608,X3	SDSF2608,X1
159A	DRUM SUB ASSEMBLY	LP20083-003A	LP20083-004A	LP20083-003A	LP20083-004A
159B	UPPER DRUM ASSEMBLY	LP20084-003A	LP20084-004A	LP20084-003A	LP20084-004A
⚠ 173	POWER CORD	QMP51K0-170	QMP4A10-170	QMP51K0-170	QMP4A10-170
184	SIDE PANEL(L) ASSEMBLY	—	—	—	LP30153-001A
185	SIDE PANEL(R)	—	—	—	LP10036-001A
WR6	WIRE,JOG/SW	PW30802-0614	←	—	—
WR7	WIRE,JOG	—	—	PW30802-0818	←

MAIN BOARD ASSEMBLY <03>

REF.NO.	MODEL ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW1	MAIN BOARD ASSEMBLY	PB11046E-01	PB11046G-01	PB11046D-01	PB11046F-01
IC201	IC	—	BH7634AS	—	BH7634AS
IC202	IC	TC74HC4052AP	—	TC74HC4052AP	—
IC601	IC	—	BA15218F-XE	—	BA15218F-XE
IC701	QFP IC(MCU)	HD6433929TA72F	HD6433929TA73F	HD6433929TA72F	HD6433929TA73F
Q202	TRANSISTOR	2SB1218A(QR)	—	2SB1218A(QR)	—
Q205	TRANSISTOR	2SD1819A(QRS)	—	2SD1819A(QRS)	—
Q207	TRANSISTOR	—	2SB1218A(QR)	—	2SB1218A(QR)
Q702	TRANSISTOR	—	DTC114WU	—	DTC114WU
Q956	TRANSISTOR	—	—	2SB1256	←
Q957	TRANSISTOR	—	—	UN5215	←
Q1009	TRANSISTOR	—	UN511E	—	UN511E
Q1401	TRANSISTOR	2SB1218A(QR)	—	2SB1218A(QR)	—
Q1402	TRANSISTOR	UN521E	—	UN521E	—
Q1403	TRANSISTOR	—	2SB1218A(QR)	—	2SB1218A(QR)
D12	DIODE	1N4148M	—	1N4148M	—
D254	DIODE/BUS WIRE	1N4148M	QWY124	1N4148M	QWY124
D712	DIODE	—	—	1N4148M	←
D713	DIODE	—	—	1N4148M	←
D951	FR DIODE	—	—	AU01Z	←
D964	DIODE	—	QWY123	11ES2	←
R4	RESISTOR	QRSA08J-202YN	QRSA08J-182YN	QRSA08J-202YN	QRSA08J-182YN
R25	RESISTOR	—	—	QRD161J-561	←
R28	RESISTOR	QRD161J-101	—	QRD161J-101	←

Notes : ・Mark — is not used.
・Mark ← is same as left.

REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
R29	RESISTOR	QRSA08J-391YN	—	QRSA08J-391YN	←
R31	RESISTOR	QRD161J-561	QRSA08J-561YN	—	—
R39	RESISTOR	QRSA08J-153YN	—	QRSA08J-153YN	—
R104	RESISTOR	QRSA08J-162YN	QRSA08J-152YN	QRSA08J-162YN	QRSA08J-152YN
R105	RESISTOR	QRSA08J-301YN	QRSA08J-471YN	QRSA08J-301YN	QRSA08J-471YN
R203	RESISTOR	QRD123J-331SX	—	QRD123J-331SX	—
R207	RESISTOR	QRSA08J-101YN	QRSA08J-242YN	QRSA08J-101YN	QRSA08J-242YN
R208	RESISTOR	—	QRSA08J-222YN	—	QRSA08J-222YN
R210	RESISTOR	—	QRSA08J-332YN	—	QRSA08J-332YN
R211	RESISTOR	—	QRSA08J-0R0Y	—	QRSA08J-0R0Y
R212	RESISTOR	QRSA08J-223YN	—	QRSA08J-223YN	—
R213	RESISTOR	QRSA08J-223YN	—	QRSA08J-223YN	—
R214	RESISTOR	QRSA08J-222YN	—	QRSA08J-222YN	—
R217	RESISTOR	—	QRSA08J-750YN	—	QRSA08J-750YN
R219	RESISTOR	QRSA08J-102YN	—	QRSA08J-102YN	—
R210	RESISTOR	QRSA08J-101YN	—	QRSA08J-101YN	—
R303	RESISTOR	QRSA08J-101YN	—	QRSA08J-393YN	—
R321	RESISTOR	QRSA08J-0R0Y	—	QRSA08J-0R0Y	QRSA08J-393YN
R322	RESISTOR	—	—	—	QRSA08J-183YN
R609	RESISTOR	—	QRSA08J-333YN	—	QRSA08J-333YN
R610	RESISTOR	—	QRSA08J-103YN	—	QRSA08J-103YN
R611	RESISTOR	—	QRSA08J-224YN	—	QRSA08J-224YN
R612	RESISTOR	—	QRSA08J-473YN	—	QRSA08J-473YN
R613	RESISTOR	—	QRSA08J-473YN	—	QRSA08J-473YN
R615	RESISTOR	—	QRSA08J-221YN	—	QRSA08J-221YN
R616	RESISTOR	—	QRSA08J-221YN	—	QRSA08J-221YN
R712	RESISTOR	—	QRSA08J-472YN	—	QRSA08J-472YN
R723	RESISTOR	—	—	QRSA08J-102YN	←
R756	RESISTOR	—	QRSA08J-472YN	—	QRSA08J-472YN
R759	RESISTOR	QRSA08J-104YN	—	QRSA08J-104YN	—
R790	RESISTOR	—	QRSA08J-103YN	—	QRSA08J-103YN
R967	RESISTOR	—	—	QRSA08J-472YN	←
R968	RESISTOR	—	—	QRSA08J-222YN	←
R1401	RESISTOR	QRSA08J-473YN	—	QRSA08J-473YN	—
R1402	RESISTOR	QRSA08J-102YN	—	QRSA08J-102YN	—
R1403	RESISTOR	QRD123J-331SX	—	QRD123J-331SX	—
R1404	RESISTOR	—	QRSA08J-102YN	—	QRSA08J-102YN
C21	CAPACITOR	QCVB1CN-103	←	—	—
C26	NP E CAPACITOR	QEPF1CM-106	—	QEPF1CM-106	QEKJ1CM-106
C53	CAPACITOR	—	QCTA1CH-181	—	QCTA1CH-181
C55	E CAPACITOR	QEKJ1CM-106	QEPF1CM-106	QEKJ1CM-106	QEPF1CM-106
C56	CAPACITOR	QCTA1CH-8R0	←	—	—
C57	CAPACITOR	—	—	QCTA1CH-8R0	←
C58	CAPACITOR	—	—	QCFA1HZ-103	←
C76	CAPACITOR	QCTA1CH-510	—	QCTA1CH-510	QCTA1CH-240
C79	CAPACITOR	—	—	—	QCTA1CH-560
C123	CAPACITOR	QCTA1CH-330	QCTA1CH-560	QCTA1CH-330	QCTA1CH-560
C124	CAPACITOR	QCTA1CH-330	QCTA1CH-560	QCTA1CH-330	QCTA1CH-560
C202	E CAPACITOR	QETC1CM-107	—	QETC1CM-107	—
C203	CAPACITOR	QCYA1EK-104	—	QCYA1EK-104	—
C204	E CAPACITOR	QEKJ1CM-106	—	QEKJ1CM-106	—
C206	E CAPACITOR	—	QETC0JM-477	—	QETC0JM-477
C207	CAPACITOR	—	QCFB1EZ-223	—	QCFB1EZ-223
C208	CAPACITOR	—	QCYA1EK-223	—	QCYA1EK-223

Notes : · Mark — is not used.
· Mark ← is same as left.

REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
C209	CAPACITOR	—	QCYA1EK-223	—	QCYA1EK-223
C210	CAPACITOR	—	QCYA1EK-223	—	QCYA1EK-223
C211	CAPACITOR	—	QCYA1EK-104	—	QCYA1EK-104
C212	E CAPACITOR	—	QEKJ1CM-476	—	QEKJ1CM-476
C214	CAPACITOR	—	QCTA1CM-680	—	QCTA1CM-680
C217	E CAPACITOR	QEKJ1HM-106	—	QEKJ1HM-106	—
C218	E CAPACITOR	QEKJ0JM-476	—	QEKJ0JM-476	—
C219	CAPACITOR	QCYA1EK-104	—	QCYA1EK-104	—
C220	CAPACITOR	QCTA1CH-330	—	QCTA1CH-330	—
C222	E CAPACITOR	—	QETC1CM-476	—	QETC1CM-476
C224	CAPACITOR	—	QCTA1CH-330	—	QCTA1CH-330
C225	CAPACITOR	—	QCTA1CH-560	—	QCTA1CH-560
C303	F CAPACITOR	QFLC1HJ-223Z	—	QFLC1HJ-223Z	—
C311	CAPACITOR	QCYA1EK-333	—	QCYA1EK-333	←
C601	E CAPACITOR	—	QEKJ1CM-106	—	QEKJ1CM-106
C602	E CAPACITOR	—	QEKJ1CM-106	—	QEKJ1CM-106
C603	E CAPACITOR	—	QEKJ1CM-106	—	QEKJ1CM-106
C604	E CAPACITOR	—	QEKJ1CM-476	—	QEKJ1CM-476
C605	E CAPACITOR	—	QEKJ1CM-476	—	QEKJ1CM-476
C606	E CAPACITOR	—	QEKJ1CM-476	—	QEKJ1CM-476
C607	E CAPACITOR	—	QEKJ1CM-106	—	QEKJ1CM-106
C608	CAPACITOR	—	QCYA1EK-223	—	QCYA1EK-223
C609	E CAPACITOR	—	QEKJ1CM-106	—	QEKJ1CM-106
C611	CAPACITOR	—	QCFA1EZ-104	—	QCFA1EZ-104
C612	CAPACITOR	—	QCYA1HK-102	—	QCYA1HK-102
C719	EDL CAPACITOR	QETN0JM-228	←	←	QEZ0244-229
C955	E CAPACITOR	—	—	QEMU1EN-187	←
C1304	CAPACITOR	—	QCTA1CH-560	—	QCTA1CH-560
C1357	E CAPACITOR	—	QETA0JM-227	—	QETA0JM-227
C1359	E CAPACITOR	QETA0JM-227	—	QETA0JM-227	—
C1409	CAPACITOR	—	QCYA1HK-102	—	QCYA1HK-102
C1411	CAPACITOR	—	QCBB1HK-102	—	QCBB1HK-102
L7	COIL	—	PU59152-221J	—	PU59152-221J
L9	COIL	PU59152-820J	←	—	—
L13	COIL	—	—	PU59152-820J	←
L16	COIL	PU59152-R56J	—	PU59152-R56J	PU59152-R22J
L201	COIL/BUS WIRE	QQL29BJ-101Z	QWY124	QQL29BJ-101Z	QWY124
L203	COIL	—	QQL29BJ-101Z	—	QQL29BJ-101Z
L205	COIL	—	PU59152-R56J	—	PU59152-R56J
L208	COIL	QQL29BK-1R0Z	—	QQL29BJ-1R0Z	—
L1303	COIL	—	QQL29BJ-220Z	—	QQL29BJ-220Z
L1352	COIL	—	QQL29BJ-100Z	—	QQL29BJ-100Z
L1410	COIL	—	QQL29BJ-6R8Z	—	QQL29BJ-6R8Z
L1416	RESISTOR	—	QRSA08J-0R0Y	—	QRSA08J-0R0Y
⚠ PC901	PH COUPLER	PC123F2	PC123FY2	PC123F2	PC123FY2
W13	RESISTOR	—	QRSA08J-0R0Y	—	QRSA08J-0R0Y
W20	RESISTOR	—	QRSA08J-0R0Y	—	QRSA08J-0R0Y
TU1001	TUNER	QAU0011-001	QAU0012-001	QAU0011-001	QAU0012-001
UN1001	IF UNIT	QAU0027-001	QAU0026-001	QAU0027-001	QAU0026-001
CN705	CONNECTOR	—	—	PEMC1101-008	←
CN1401	CONNECTOR	—	—	—	PEMC1101-004

Notes : · Mark — is not used.
· Mark ← is same as left.

DISPLAY BOARD ASSEMBLY<28>

	MODEL				
REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW1	DISPLAY BOARD ASSEMBLY	PB11047G1-01	PB11047H1	PB11047F1-01	PB11055A1-02
D1208	LE DIODE,AUTO SPLP	—	—	SLR-342MC3F	—
D1209	LE DIODE,TRI-R	—	—	SLR-342DU3F	—
D1212	LE DIODE,TRI-R	—	—	—	SLR-342DU3F
D1220	DIODE	—	—	1N4148M	←
D1222	DIODE	—	—	—	1N4148M
D1251	DIODE	—	—	—	1N4148M
D1252	DIODE	—	—	—	1N4148M
⚠ R1217	RESISTOR	—	—	QRD161J-331	—
⚠ R1218	RESISTOR	—	—	QRD161J-331	←
R1251	RESISTOR	—	—	—	QRD161J-750
R1252	RESISTOR	—	—	—	QRD161J-0R0
C1203	E CAPACITOR	QEKC0JM-227	←	←	QETC0JM-227
C1206	E CAPACITOR	QEKC1HM-106	←	←	QETC1HM-106
C1254	CAPACITOR	—	—	—	QCBB1HJ-561
L1252	COIL	—	—	—	QQL29BJ-2R2Z
L1254	COIL	—	—	—	QQL29BJ-3R3Z
L1403	COIL	—	—	—	
S1205	TACT SWITCH,C.RESET	PESW0525-02Z	←	←	—
S1206	TACT SWITCH,TRI-R	—	—	PESW0525-02Z	←
S1207	TACT SWITCH,RE-VIEW	PESW0525-02Z	←	←	—
S1208	TACT SWITCH,C.RESET	—	—	PESW0525-02Z	←
S1212	TACT SWITCH,STOP/EJECT	—	—	PESW0525-02Z	←
S1213	TACT SWITCH,PLAY	—	—	PESW0525-02Z	←
S1214	TACT SWITCH,REW	—	—	—	PESW0525-02Z
S1216	TACT SWITCH,FF	—	—	—	PESW0525-02Z
S1218	TACT SWITCH,S1213/18	PESW0525-02Z	←	—	—
S1219	TACT SWITCH,S1212/19	PESW0525-02Z	←	—	—
HD3	LEDHOLDER,X2 D1208 D1209	—	—	PQM30038-6	—
CN1202	CONNECTOR	—	—	—	PEMC1101-104
CN1203	CONNECTOR	PEMC1101-006	←	—	—
J1201	PIN JACK	—	—	—	PEMC1009-04
J1203	PIN JACK(SW),	—	—	—	PEMC1010-03

REC SAFETY BOARD ASSEMBLY <32>

	MODEL				
REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW3	REC SAFETY BOARD ASSY	PB11047A3	←	←	PB11055A3-01

CASSETTE SWITCH BOARD ASSEMBLY <33>

	MODEL				
REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW4	CASSETTE SW. BOARD ASSY	PB11047A4-01	←	←	PB11055A4-01

Notes : ・Mark — is not used.
・Mark ← is same as left.

JOG/SW BOARD ASSEMBLY <37>

	MODEL				
REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW2	JOG/SW BOARD ASSEMBLY	PB11047D2-01	PB11047E2-01	PB11047A2-01	PB11055A2
S1214	TACT SWITCH,INDEX-	PESW0525-02Z	←	—	—
S1215	TACT SWITCH,INDEX+	PESW0525-02Z	←	—	—
S1216	TACT SWITCH,PLAY	PESW0525-02Z	←	—	—
S1217	TACT SWITCH,STOP/EJECT	PESW0525-02Z	←	—	—
UN1291	JOG SHUTTLE ASSEMBLY	PEME0786-02	—	PEME0786-02	←
CN1204	CONNECTOR	PEMC1101-106	←	—	—
CN1205	CONNECTOR	—	—	PEMC1101-108	←

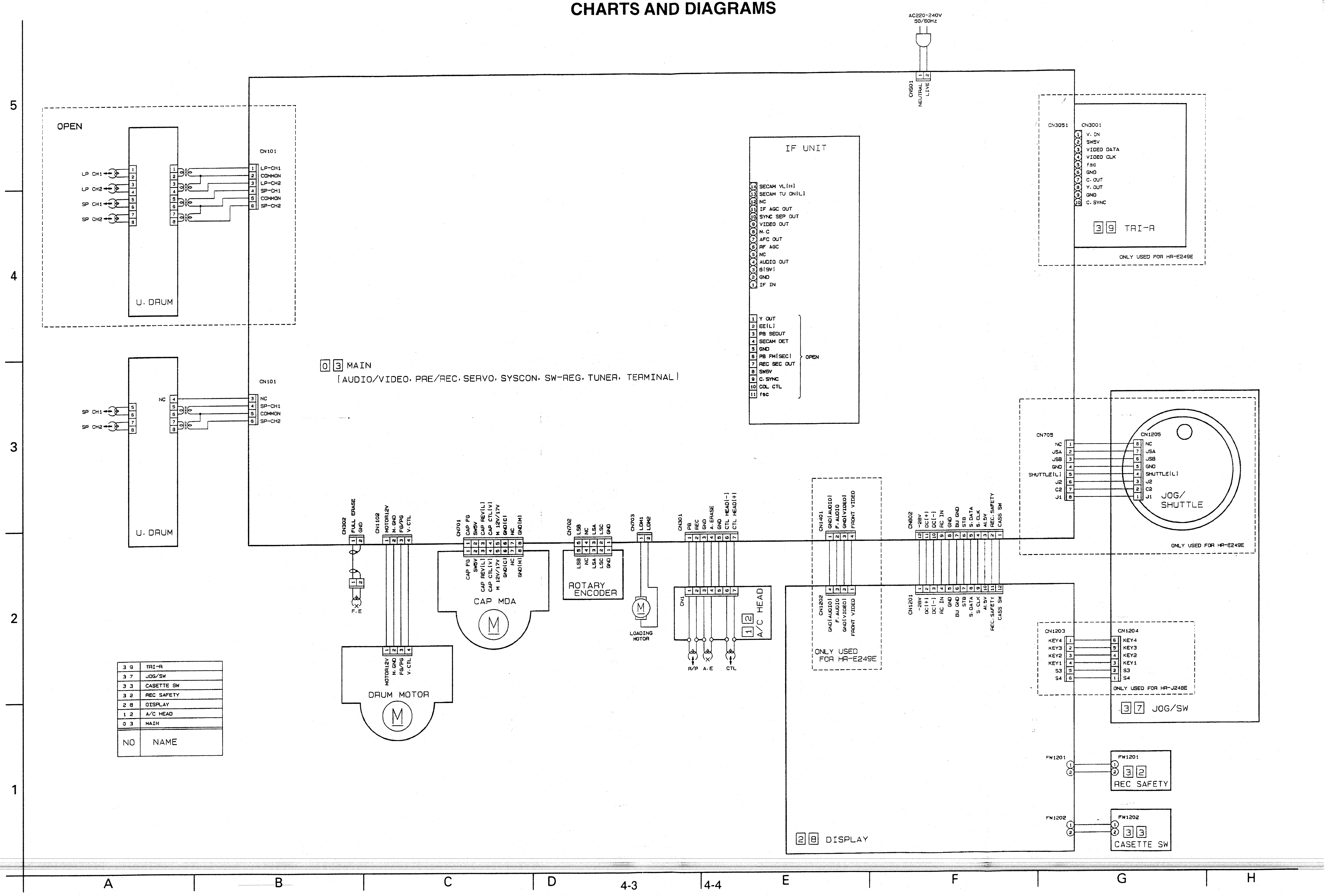
TRI-R BOARD ASSEMBLY <39>

	MODEL				
REF.NO.	ITEM	HR-J245EK	HR-J248E	HR-J249EK	HR-E249E
PW1	TRI-R BOARD ASSEMBLY	—	—	PB11049A-01	←

Notes : ・Mark — is not used.
・Mark ← is same as left.

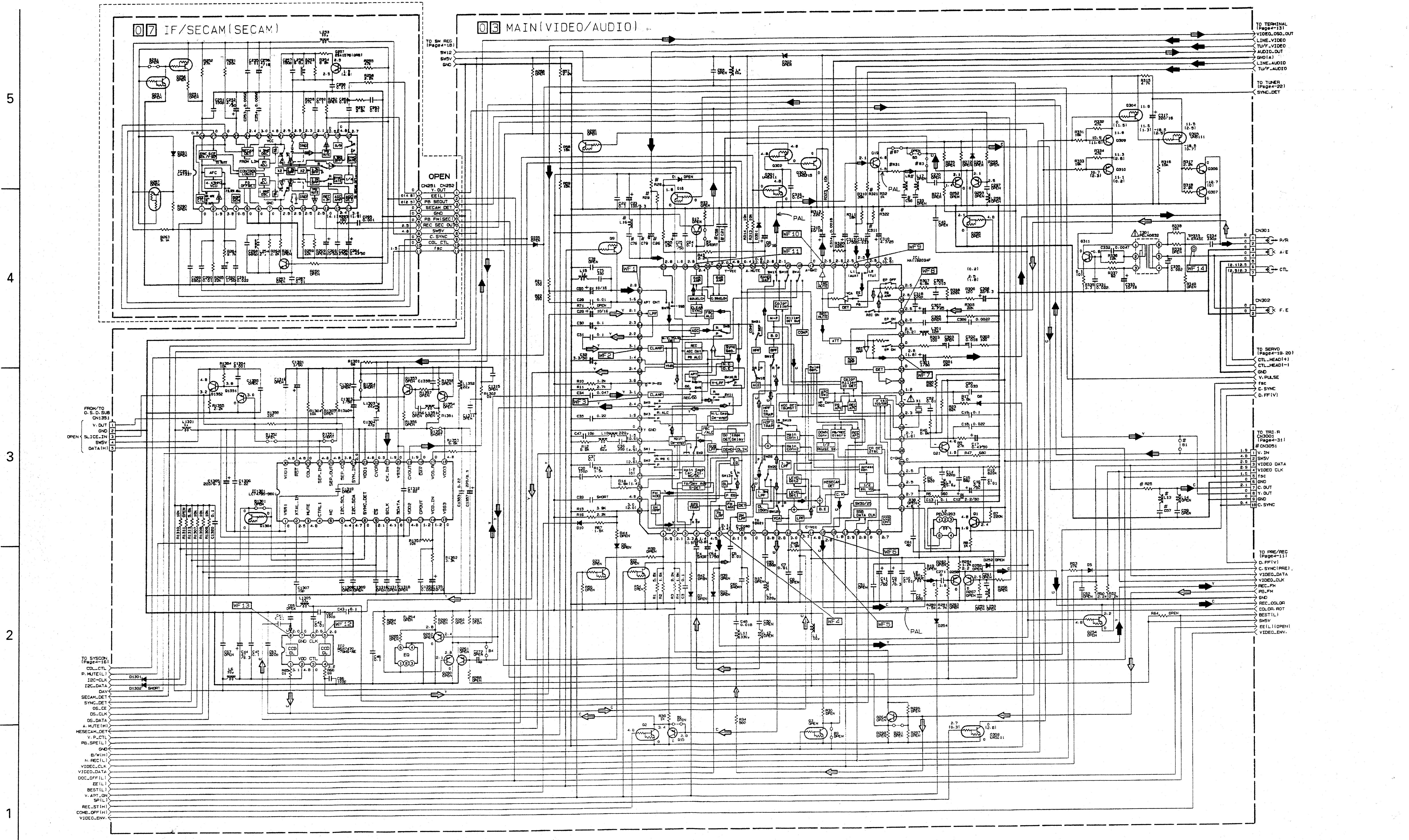
4.1 BOARD INTERCONNECTIONS

SECTION 4
CHARTS AND DIAGRAMS


AC220-240V 50/60Hz
CN901 NEUTRAL LIVE
OPEN
LP CH1
LP CH2
SP CH1
SP CH2
U. DRUM
CN101
LP-CH1
COMMON
LP-CH2
SP-CH1
COMMON
SP-CH2
NC
0 3 MAIN
(AUDIO/VIDEO, PRE/REC, SERVO, SYSCON, SW-REG, TUNER, TERMINAL)
IF UNIT
SECAM VL(H)
SECAM TU ON(L)
NC
IF AGC OUT
SYNC SEP OUT
VIDEO OUT
N.C
AFC OUT
RF AGC
NC
AUDIO OUT
B(9V)
GND
IF IN
Y OUT
EE(L)
PB SEOUT
SECAM DET
GND
PB FM(SEC)
REC SEC OUT
SW5V
C. SYNC
COL CTL
fsc
OPEN
CN3051
CN3001
V. IN
SW5V
VIDEO DATA
VIDEO CLK
fsc
GND
C. OUT
Y. OUT
GND
C. SYNC
3 9 TRI-A
ONLY USED FOR HR-E249E
CN705
NC
JSA
JSB
GND
SHUTTLE(L)
J2
C2
J1
CN1205
JOG/ SHUTTLE
ONLY USED FOR HR-E249E
CN302 FULL ERASE GND
F.E
CN1102 MOTOR12V M.GND FG/PG V.CTL
DRUM MOTOR
M
CN701 CAP FG SW5V CAP REV(L) CAP CTL(V) M 12V/17V GND(C) NC GND(H)
CAP MDA
CN702 LSB NC LSA LSC GND
ROTARY ENCODER
CN703 LDM1 LDM2
LOADING MOTOR
CN301 PB REC GND A.ERASE GND CTL HEAD(-) CTL HEAD(+)
CN1
1 2 A/C HEAD
R/P A.E CTL
CN1401 GND(AUDIO) F.AUDIO GND(VIDEO) FRONT VIDEO
CN1202
ONLY USED FOR HR-E249E
CN802 -28V DC(+) DC(-) RC IN GND BU GND STB S.DATA S.CLK AI 5V REC. SAFETY CASS SW
CN1201
CN1203
KEY4
KEY3
KEY2
KEY1
S3
S4
CN1204
ONLY USED FOR HR-J248E
3 7 JOG/SW
FW1201
3 2 REC SAFETY
FW1202
3 3 CASETTE SW
2 8 DISPLAY
1
2
3
4
5
A
B
C
D
E
F
G
H

NO	NAME
3 9	TRI-A
3 7	JOG/SW
3 3	CASETTE SW
3 2	REC SAFETY
2 8	DISPLAY
1 2	A/C HEAD
0 3	MAIN

4.4 VIDEO AND N.AUDIO SCHEMATIC DIAGRAM


07 IF/SECAM(SECAM)
03 MAIN(VIDEO/AUDIO)
OPEN
CN251 CN252
Y. OUT
EE(L)
PB SECOUT
SECAM DET
GND
PB FM(SEC)
REC SEC OUT
SW5V
C. SYNC
COL. CTL
fsc
TO SW REG (Page4-18)
SW12
SW5V
GND
TO TERMINAL (Page4-13)
VIDEO_OSD_OUT
LINE_VIDEO
TU/F_VIDEO
AUDIO_OUT
GND(A)
LINE_AUDIO
TU/F_AUDIO
TO TUNER (Page4-22)
SYNC_DET
CN301
P/R
A/E
CTL
CN302
F.E
TO SERVO (Page4-19. 20)
CTL_HEAD(+)
CTL_HEAD(-)
GND
V. PULSE
fsc
C. SYNC
D. FF(V)
TO TRI. R CN3001 (Page4-31)
# CN3051
V. IN
SW5V
VIDEO DATA
VIDEO CLK
fsc
GND
C. OUT
Y. OUT
GND
C. SYNC
TO PRE/REC (Page4-11)
D. FF(V)
C. SYNC(PRE)
VIDEO_DATA
VIDEO_CLK
REC_FM
PB_FM
GND
REC_COLOR
COLOR. ROT
BEST(L)
SW5V
EE(L)(OPEN)
VIDEO_ENV.
FROM/TO O. S. D. SUB CN1351
V. OUT
GND
OPEN
SLICE_IN
SW5V
DATA(H)
TO SYSCON (Page4-16)
COL_CTL
P. MUTE(L)
I2C-CLK
I2C_DATA
DAV
SECAM_DET
SYNC_DET
OS_CE
OS_CLK
OS_DATA
A. MUTE(M)
MESECAM_DET
V. P_CTL
PB_SPE(L)
GND
B/W(H)
N. REC(L)
VIDEO_CLK
VIDEO_DATA
DOC_OFF(L)
EE(L)
BEST(L)
V. APT_ON
SP(L)
REC_ST(H)
COMB_OFF(H)
VIDEO_ENV.
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
PAL
IC1 HA118203AF
5
4
3
2
1

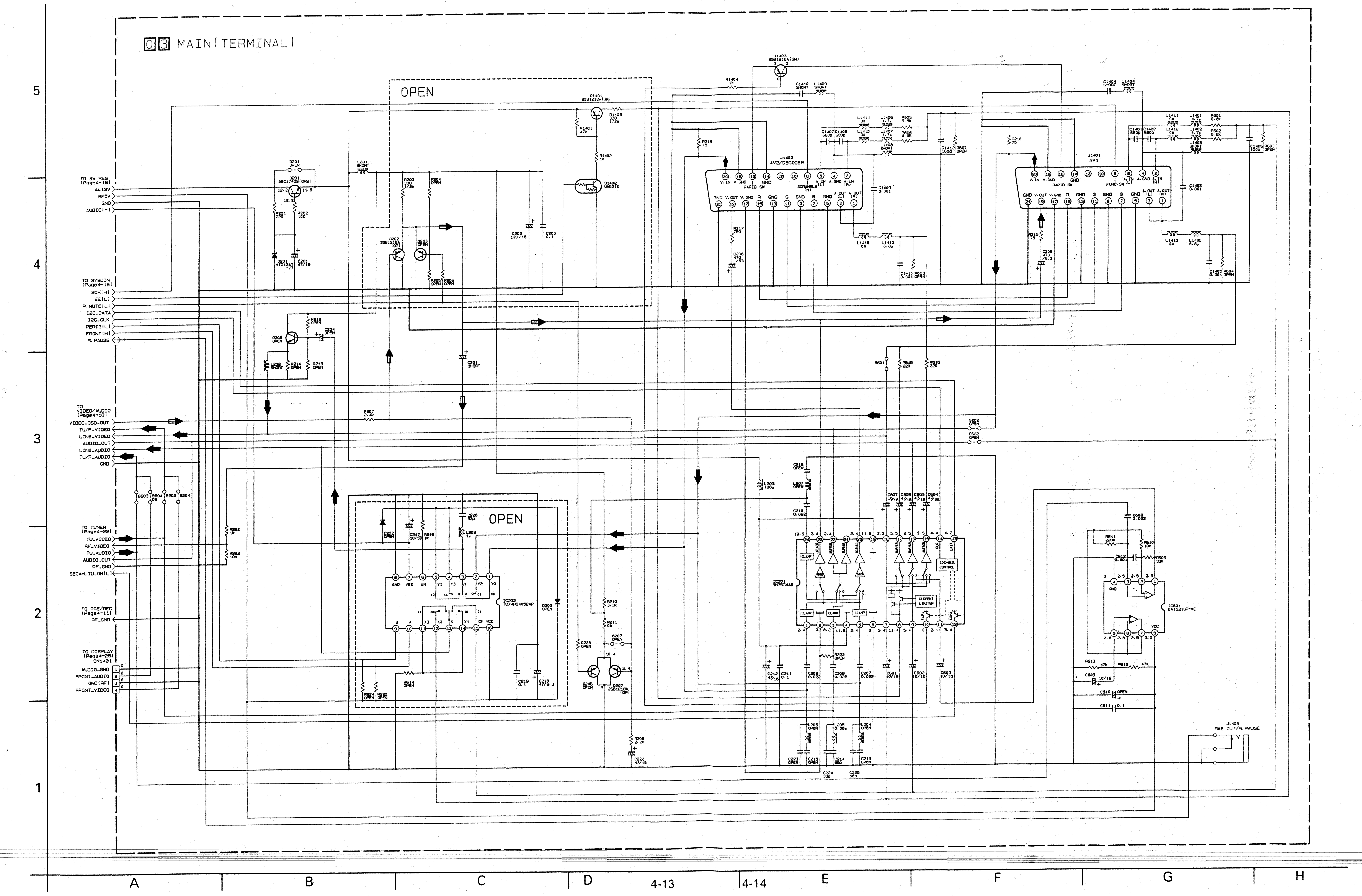
NOTES : 1. Unless otherwise specified.
All PNP type transistors are 2SB1218A(QR).
All NPN type transistors are 2SD1819A(QRS).
All PNP type digital transistors are UN511E.
All NPN type digital transistors are UN521E.
2. For VIDEO/AUDIO waveforms please refer to page4-23.

3. COMPARISON CHART OF MODELS & MARKS(#).

MODELS \ REF. No	R25	R28	R29	R31	R321	R322	C21	C26	C56	C57	C58	C76	C79	C311	L9	L13	L16	B1	B3	B7	CN3051
HR-J248E	OPEN	OPEN	OPEN	560	OPEN	OPEN	0.01	OPEN	8P	OPEN	OPEN	OPEN	OPEN	OPEN	82μ	OPEN	OPEN	SHORT	SHORT	OPEN	NOT USED
HR-E249E	560	100	560	OPEN	39k	18k	OPEN	10/16	OPEN	8P	0.01	24P	55P	0.033	OPEN	82μ	0.22	OPEN	OPEN	SHORT	USED

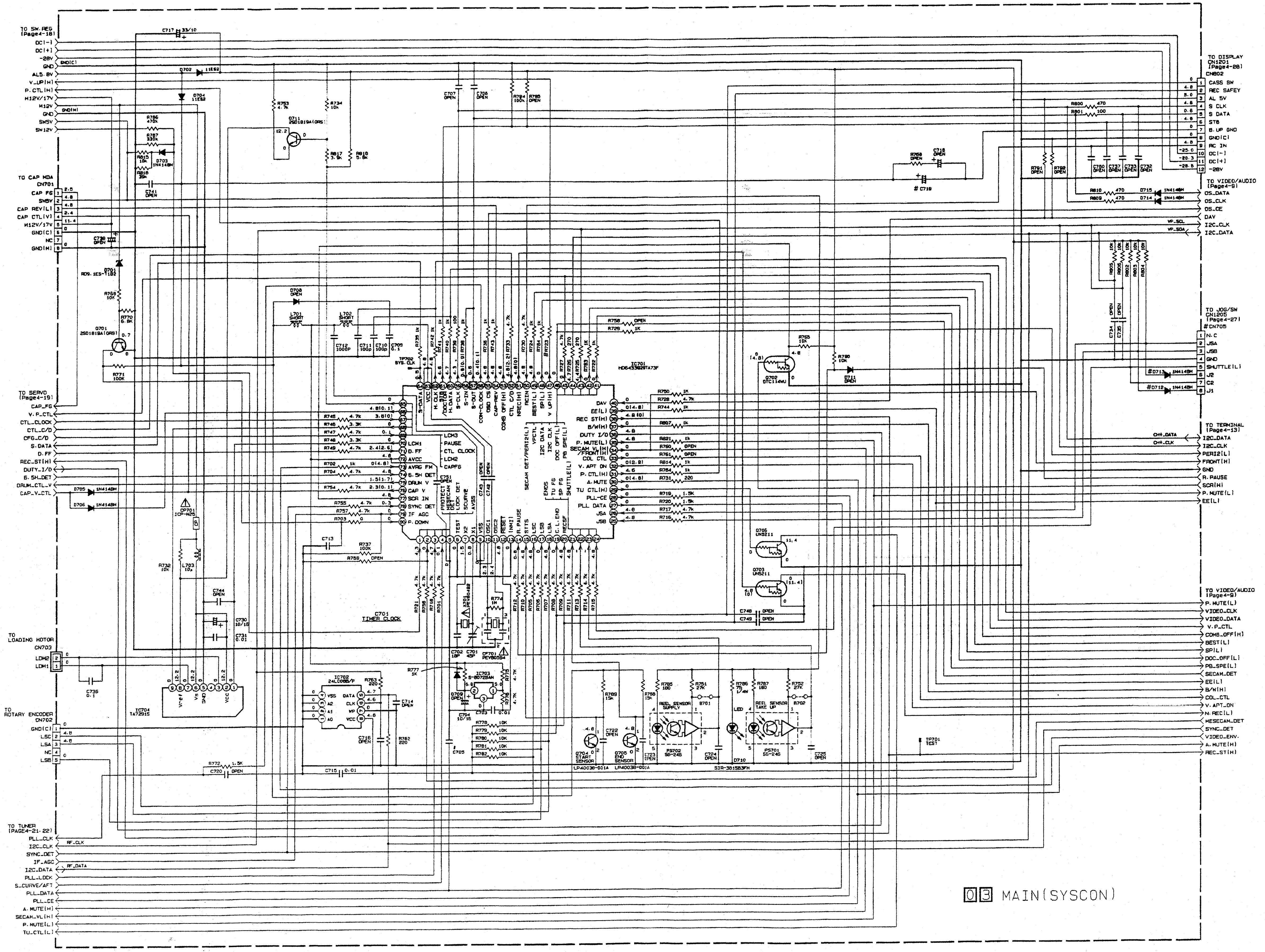
A B C D E F G H

4.6 TERMINAL SCHEMATIC DIAGRAM



03 MAIN(TERMINAL)
OPEN
TO SW REG (Page4-18)
AL12V
RF5V
GND
AUDIO(-)
TO SYSCON (Page4-16)
SCR(H)
EE(L)
P.MUTE(L)
I2C_DATA
I2C_CLK
PERI2(L)
FRONT(H)
R.PAUSE
TO VIDEO/AUDIO (Page4-10)
VIDEO_OSD_OUT
TU/F_VIDEO
LINE_VIDEO
AUDIO_OUT
LINE_AUDIO
TU/F_AUDIO
GND
B603
B604 0Ω
B203
B204
TO TUNER (Page4-22)
TU_VIDEO
RF_VIDEO
TU_AUDIO
AUDIO_OUT
RF_GND
SECAM_TU_ON(L)
TO PRE/REC (Page4-11)
RF_GND
TO DISPLAY (Page4-28) CN1401
AUDIO_GND
FRONT_AUDIO
GND(RF)
FRONT_VIDEO
B201 OPEN
Q201 2SC1740S(QRS)
12.2
11.6
R201 220
R202 100
D201 MTZ12AT-77
C201 47/16
L201 SHORT
R203 330 1/2W
R204 OPEN
Q202 2SB1218A (QR)
Q203 OPEN
R205 OPEN
R206 OPEN
C202 100/16
C203 0.1
Q1401 2SB1218A(QR)
R1401 47K
R1402 1k
R1403 330 1/2W
Q1402 UN521E
R212 OPEN
C204 OPEN
Q205 OPEN
L202 SHORT
R214 OPEN
R213 OPEN
C221 SHORT
R207 2.4k
R221 1k
R222 10k
D202 OPEN
C217 10/50
R219 1k
C220 33p
L208 1μ
IC202 TC74HC4052AP
GND
VEE
EN
Y1
Y3
Y
Y2
Y0
B
A
X3
X0
X
X1
X2
VCC
D203 OPEN
R614 OPEN
R224 OPEN
R225 OPEN
C219 0.1
C218 47/6.3
R210 3.3k
R211 0Ω
B207 OPEN
R226 OPEN
10.4
2.4
Q206 OPEN
Q207 2SB1218A (QR)
R208 2.2k
C222 47/16
Q1403 2SB1218A(QR)
R1404 1k
C1410 SHORT
L1409 SHORT
R218 75
J1402 AV2/DECODER
V.IN
V.GND
RAPID SW
GND
SCRAMBLE (H)
A.IN (L)
A.GND
A.IN (R)
V.OUT
R
G
B
A.OUT (L)
A.OUT (R)
C1407 680p
C1408 680p
L1414 0Ω
L1415 0Ω
L1406 4.7μ
L1407 4.7μ
L1408 SHORT
R605 5.8k
R606 5.8k
C1412 100p
R607 OPEN
C1409 0.001
R217 750
C206 470/63
L1416 0Ω
L1410 6.8μ
C1411 0.001
R608 OPEN
C1404 SHORT
L1404 SHORT
R216 75
J1401 AV1
FUNC.SW
C1401 680p
C1402 680p
L1411 0Ω
L1412 0Ω
L1401 4.7μ
L1402 4.7μ
L1403 SHORT
R601 6.8k
R602 6.8K
C1406 100p
R603 OPEN
C1403 0.001
R215 75
C205 470/6.3
L1413 0Ω
L1405 6.8μ
C1405 0.001
R604 OPEN
B601
R615 220
R616 220
B202 OPEN
B602 OPEN
C216 OPEN
L203 100μ
L207 OPEN
C210 0.022
C607 10/16
C606 47/16
C605 47/16
C604 47/16
IC201 BH7634AS
CLAMP
DRIVER
BUFFER
6dB
CLK
DATA
I2C-BUS CONTROL
CURRENT LIMITER
EXP1
EXP2
10.6
2.4
11.6
2.5
5.5
4.4
4.2
0
8.2
5.4
11.4
2.1
3.4
R223 OPEN
C212 47/16
C211 0.1
C209 0.022
C208 0.022
C207 0.022
C601 10/16
C602 10/16
C603 10/16
L206 OPEN
L205 0.56μ
L204 OPEN
C223 OPEN
C215 OPEN
C214 56p
C224 330
C225 56p
C213 OPEN
C608 0.022
R611 220k
R610 10k
C612 0.001
R609 33k
IC501 BA15218F-XE
2.6
5.0
R613 47k
R612 47k
C609 10/16
C610 OPEN
C611 0.1
J1403 RAE OUT/R.PAUSE
1
2
3
4
5
A
B
C
D
E
F
G
H

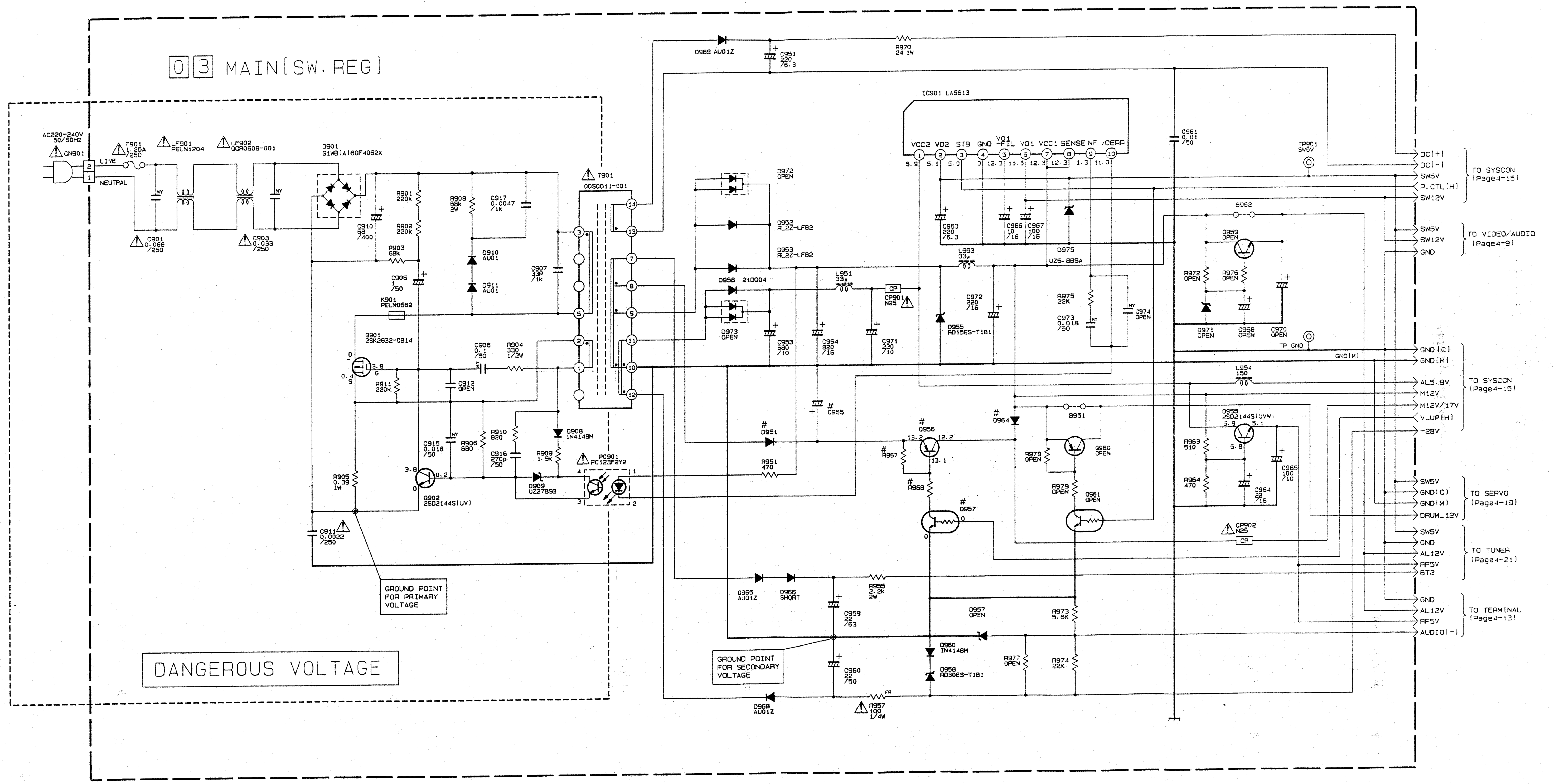
4.7 SYSCON SCHEMATIC DIAGRAM


TO SW.REG (Page4-18)
TO CAP MDA CN701
TO SERVO (Page4-19)
TO LOADING MOTOR CN703
TO ROTARY ENCODER CN702
TO TUNER (PAGE4-21·22)
TO DISPLAY CN1201 (Page4-28) CN802
TO VIDEO/AUDIO (Page4-9)
TO JOG/SW CN1205 (Page4-27) #CN705
TO TERMINAL (Page4-13)
TO VIDEO/AUDIO (Page4-9)
IC701 HD6433029TA73F
IC702 24LC08B/P
IC703 S-80728AN
IC704 TA7291S
X701 TIMER CLOCK
START SENSOR
END SENSOR
REEL SENSOR SUPPLY
REEL SENSOR TAKE UP
03 MAIN(SYSCON)

NOTE:COMPARISON CHART OF MODELS & MARKS(#).

REF. No	MODELS	
	HR-J248E	HR-E249E
D712	NOT USED	USED
D713	NOT USED	USED
R723	OPEN	1k
CN705	NOT USED	USED
C719	2200/6.3	0.022/5.5

4.8 SW REGULATOR SCHEMATIC DIAGRAM

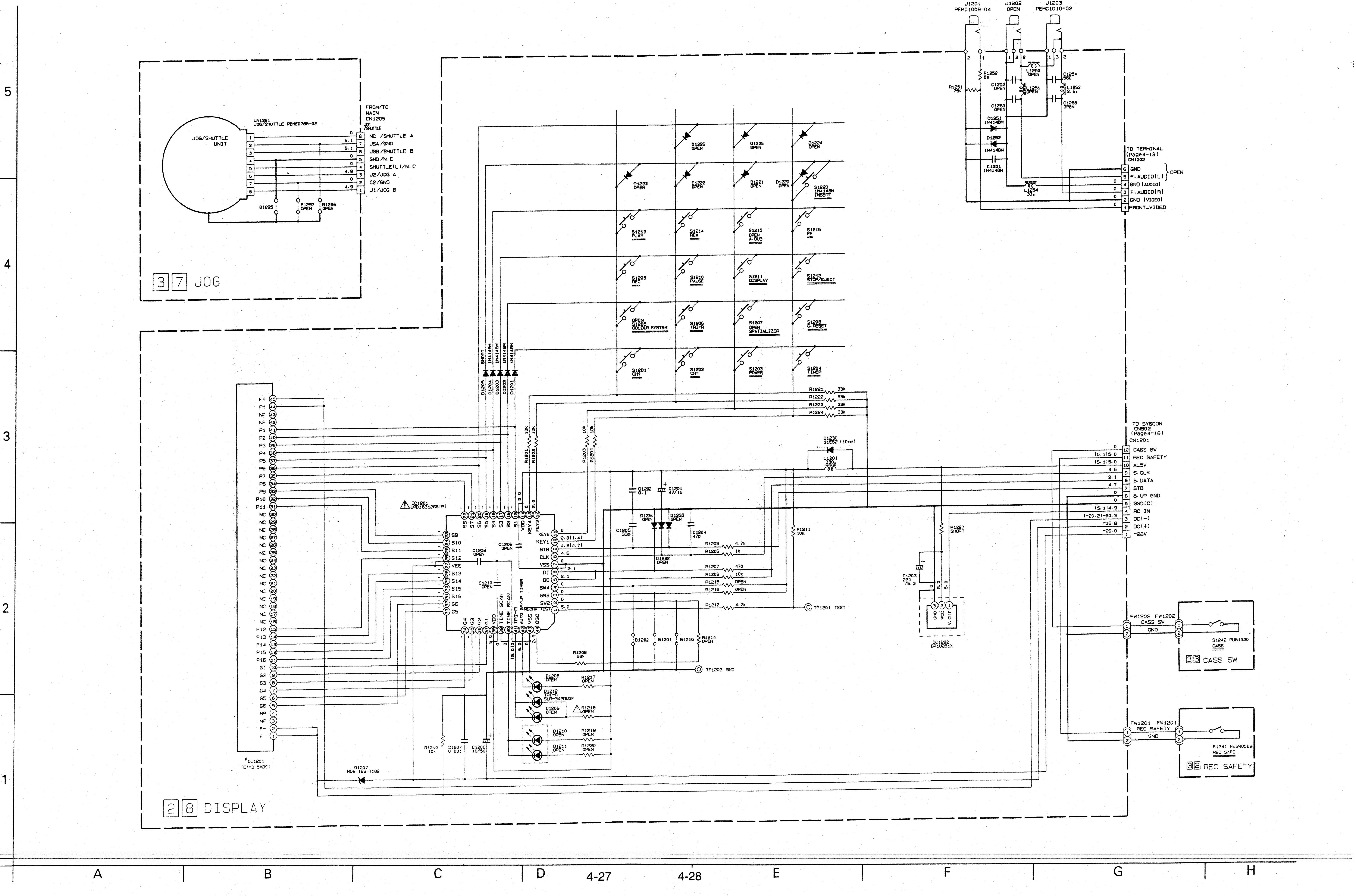


0 3 MAIN[SW. REG]
AC220-240V 50/60Hz
CN901
LIVE
NEUTRAL
F901 1.25A /250
LF901 PELN1204
LF902 QQR0608-001
C901 0.068 /250
C903 0.033 /250
D901 S1WB(A)60F4062X
C910 68 /400
R901 220k
R902 220k
R903 68k
C906 1 /50
R908 68K 2W
C917 0.0047 /1k
D910 AU01
D911 AU01
C907 33P /1k
K901 PELN0662
Q901 2SK2632-CB14
D
G
S
3.8
0.4
R911 220k
C912 OPEN
C908 0.1 /50
R904 330 1/2W
T901
QQS0011-C01
C915 0.018 /50
R906 680
R910 820
C916 270p /50
D908 1N4148M
R909 1.5k
R905 0.39 1W
Q902 2SD2144S(UV)
3.8
0.2
0
D909 UZ27BSB
PC901 PC123F2Y2
C911 0.0022 /250
GROUND POINT FOR PRIMARY VOLTAGE
DANGEROUS VOLTAGE
D969 AU01Z
C951 220 /6.3
R970 24 1W
IC901 LA5613
VCC2 VO2 STB GND VO1-FIL VO1 VCC1 SENSE NF VOERR
5.9 5.1 5.0 0 12.3 11.5 12.3 12.3 1.3 11.0
C961 0.01 /50
TP901 SW5V
D972 OPEN
D952 RL2Z-LFB2
D953 RL2Z-LFB2
D956 21DQ04
D973 OPEN
C963 220 /6.3
C966 10 /16
C967 100 /16
D975 UZ6.8BSA
L953 33μ
L951 33μ
CP
CP901 N25
C972 220 /16
D955 RD15ES-T1B1
R975 22K
C973 0.018 /50
C974 OPEN
C953 680 /10
C954 820 /16
C971 220 /10
C955
B952
Q959 OPEN
R972 OPEN
R976 OPEN
D971 OPEN
C968 OPEN
C970 OPEN
TP GND
GND(M)
L954 150
D951
D964
B951
Q956
13.2
12.2
13.1
R967
R968
R951 470
Q957
0
R978 OPEN
Q960 OPEN
R979 OPEN
Q961 OPEN
Q955 2SD2144S(UVW)
5.9
5.1
5.8
R963 510
R964 470
C964 22 /16
C965 100 /10
CP902 N25
D965 AU01Z
D966 SHORT
R955 2.2K 2W
C959 22 /63
D957 OPEN
R973 5.6K
D960 1N4148M
D958 RD30ES-T1B1
R977 OPEN
R974 22K
C960 22 /50
GROUND POINT FOR SECONDARY VOLTAGE
D968 AU01Z
R957 100 1/4W
FR
DC(+)
DC(-)
SW5V
P.CTL(H)
SW12V
TO SYSCON (Page4-15)
SW5V
SW12V
GND
TO VIDEO/AUDIO (Page4-9)
GND(C)
GND(M)
AL5.8V
M12V
M12V/17V
V_UP(H)
-28V
TO SYSCON (Page4-15)
SW5V
GND(C)
GND(M)
DRUM_12V
TO SERVO (Page4-19)
SW5V
GND
AL12V
RF5V
BT2
TO TUNER (Page4-21)
GND
AL12V
RF5V
AUDIO(-)
TO TERMINAL (Page4-13)
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE: COMPARISON CHART OF MODELS & MARKS(#).

	REF. No	Q956	Q957	D951	D964	R967	R968	C955
MODELS	HR-J248E	OPEN	OPEN	OPEN	SHORT	OPEN	OPEN	OPEN
	HR-E249E	2SB1256	UN5215	AU01Z	11ES2	4.7k	2.2k	180/25

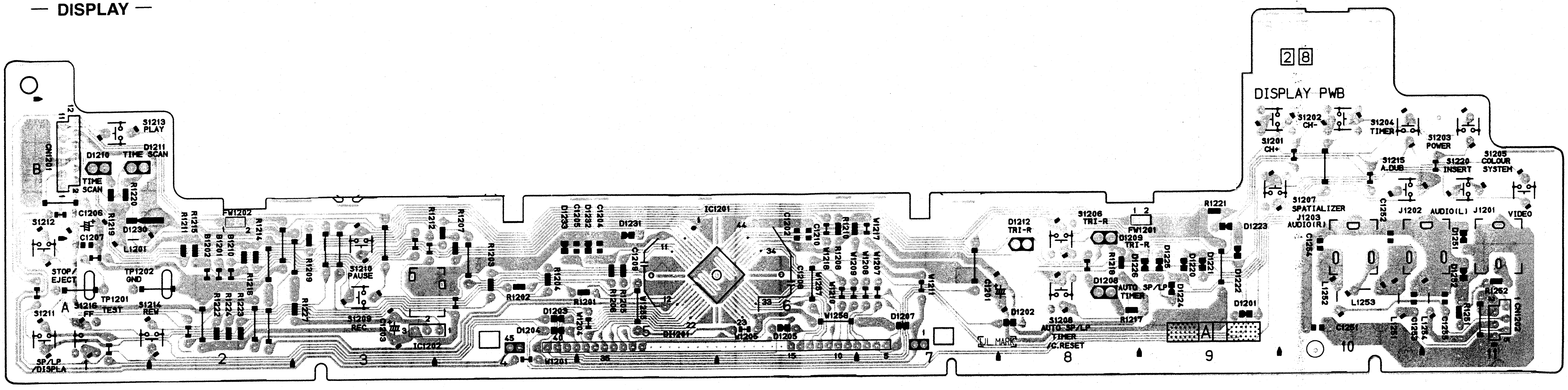
4.12 DISPLAY, REC SAFETY, CASSETTE SW AND JOG SCHEMATIC DIAGRAM
(for HR-E249E)



5
4
3
2
1
A
B
C
D
E
F
G
H
JOG/SHUTTLE UNIT
UN1291 JOG/SHUTTLE PEME0786-02
FROM/TO MAIN CN1205 JOG/SHUTTLE
NC /SHUTTLE A
JSA /GND
JSB /SHUTTLE B
GND /N.C
SHUTTLE(L)/N.C
J2/JOG A
C2/GND
J1/JOG B
0
5.1
5.1
0
0
4.9
0
4.9
B1295
B1297 OPEN
B1296 OPEN
37 JOG
VIDEO IN J1201 PEMC1009-04
AUDIO(L) IN J1202 OPEN
AUDIO(R) IN J1203 PEMC1010-02
R1252 0Ω
R1251 75Ω
C1252 OPEN
L1251 OPEN
L1253 OPEN
C1253 OPEN
C1254 560
L1252 2.2μ
C1255 OPEN
D1251 1N4148M
D1252 1N4148M
C1251 1N4148M
L1254 33μ
TO TERMINAL (Page4-13) CN1202
GND
F.AUDIO(L)
OPEN
GND (AUDIO)
F.AUDIO(R)
GND (VIDEO)
FRONT_VIDEO
D1226 OPEN
D1225 OPEN
D1224 OPEN
D1223 OPEN
D1222 OPEN
D1221 OPEN
D1220 OPEN
S1220 1N4148M INSERT
S1213 PLAY
S1214 REW
S1215 OPEN A.DUB
S1216 FF
S1209 REC
S1210 PAUSE
S1211 DISPLAY
S1212 STOP/EJECT
OPEN S1205 COLOUR SYSTEM
S1206 TRI-R
S1207 OPEN SPATIALIZER
S1208 C.RESET
S1201 CH+
S1202 CH-
S1203 POWER
S1204 TIMER
R1221 33k
R1222 33k
R1223 33k
R1224 33k
SHORT
1N4148M
D1205
D1204
D1203
D1202
D1201
R1201 10k
R1202 10k
R1203 10k
R1204 10k
F+
NP
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
NC
P12
P13
P14
P15
P16
G1
G2
G3
G4
G5
G6
F-
#DI1201 (Ef=3.5VDC)
IC1201 UPD16312GB(P)
S8
S7
S6
S5
S4
S3
S2
S1
VDD
KEY4
KEY3
KEY2
KEY1
STB
CLK
VSS
DI
DO
SW4
SW3
SW2
RECHA TEST
S9
S10
S11
S12
VEE
S13
S14
S15
S16
G6
G5
G4
G3
G2
G1
VDD
TIME SCAN
TIME SCAN
TRI-R
AUTO SP/LP TIMER
VSS
OSC
5.0
0
2.0
2.0(1.4)
4.8(4.7)
4.6
2.1
5.0
(5.0)0
2.9
C1208 OPEN
C1209 OPEN
C1210 OPEN
C1202 0.1
C1201 47/16
C1205 33p
D1231 OPEN
D1233 OPEN
D1232 OPEN
C1204 47p
D1230 11ES2 (10mm)
L1201 330μ
R1211 10k
R1205 4.7k
R1206 1k
R1207 470
R1209 10k
R1215 OPEN
R1216 OPEN
R1212 4.7k
TP1201 TEST
B1202
B1201
B1210
R1214 OPEN
R1208 56k
TP1202 GND
D1208 OPEN
R1217 OPEN
D1212 TRI-R SLR-342OU3F
D1209 OPEN
R1218 OPEN
D1210 OPEN
R1219 OPEN
D1211 OPEN
R1220 OPEN
R1210 10k
C1207 0.001
C1206 10/50
D1207 RD9.1ES-T1B2
28 DISPLAY
R1227 SHORT
C1203 220 /6.3
IC1202 GP1U281X
GND
VCC
V.OUT
TO SYSCON CN802 (Page4-16) CN1201
CASS SW
REC SAFETY
AL5V
S.CLK
S.DATA
STB
B.UP GND
GND(C)
RC IN
DC(-)
DC(+)
-28V
(5.1)5.0
4.6
2.1
4.7
(5.1)4.9
(-20.2)-20.3
-16.8
-29.0
FW1202 FW1202 CASS SW
GND
S1242 PU61320 CASS
33 CASS SW
FW1201 FW1201 REC SAFETY
GND
S1241 PESW0589 REC SAFE
32 REC SAFETY

4.13 DISPLAY, REC SAFETY, CASSETTE SW AND JOG CIRCUIT BOARDS
(for HR-E249E)

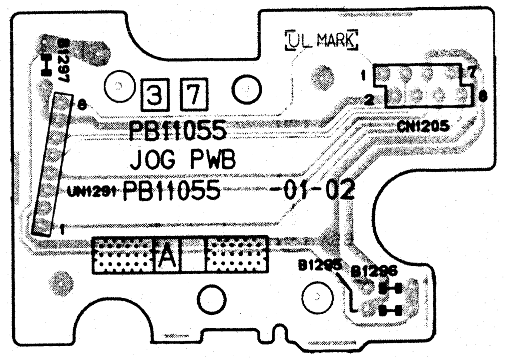
— DISPLAY —


2 8
DISPLAY PWB
S1213 PLAY
D1211 TIME SCAN
D1210
TIME SCAN
CN1201
B
R1220
S1212
C1206
C1207
R1219
D1230
L1201
FW1202
STOP/ EJECT
TP1202 GND
TP1201 TEST
S1216 FF
S1214 REW
S1211
A
SP/LP /DISPLA
S1210 PAUSE
S1209 REC
IC1202
C1203
IC1201
D1231
D1203
D1204
R1202
R1201
W1201
D1201
W1205
D1205
D1207
D1202
D1212 TRI-R
S1206 TRI-R
FW1201
D1209 TRI-R
D1208
AUTO SP/LP TIMER
S1208 AUTO SP/LP TIMER /C.RESET
UL MARK
R1217
R1221
D1223
D1221
D1222
D1220
D1224
D1225
D1226
S1202 CH-
S1201 CH+
S1204 TIMER
S1203 POWER
S1215 A.DUB
S1220 INSERT
S1205 COLOUR SYSTEM
S1207 SPATIALIZER
J1203 AUDIO(R)
J1202 AUDIO(L)
J1201 VIDEO
C1252
C1254
L1252
L1253
C1251
R1251
R1252
C1253
L1254
C1255
D1251
D1252
CN1202
A
1 2 3 4 5 6 7 8 9 10 11

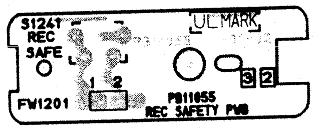
COMPONENT PARTS LOCATION GUIDE <DISPLAY>

REF.No.	LOCATION		
CAPACITOR			
C1201	A	D	8A
C1202	A	D	6A
C1203	A	D	3A
C1204	A	D	5B
C1205	A	D	5B
C1206	A	D	1B
C1207	A	D	1A
C1208	A	D	6A
C1209	A	D	5B
C1210	A	D	6A
C1251	A	D	10A
C1252	A	D	10B
C1253	A	D	10A
C1254	A	D	10A
C1255	A	D	11A
CONNECTOR			
CN1201	A	D	1B
CN1202	A	D	11A
DIODE			
D1201	A	D	9A
D1202	A	D	8A
D1203	A	D	4A
D1204	A	D	4A
D1205	A	D	6A
D1207	A	D	7A
D1208	A	D	8A
D1209	A	D	8A
D1210	A	D	1B
D1211	A	D	1B
D1212	A	D	8A
D1220	A	D	9A
D1221	A	D	9A
D1222	A	D	9A
D1223	A	D	9B
D1224	A	D	9A
D1225	A	D	9A
D1226	A	D	9A
D1230	A	D	2B
D1231	A	D	5B
D1232	A	D	5B
D1233	A	D	4B
D1251	A	D	11A
D1252	A	D	11A
IC			
IC1201	B	C	6A
IC1202	A	D	3A
COIL			
L1201	A	D	1B
L1251	A	D	10A
L1252	A	D	10A
L1253	A	D	10A
L1254	A	D	11A
RESISTOR			
R1201	A	D	4A
R1202	A	D	4A
R1203	A	D	4A
R1204	A	D	4A
R1205	A	D	5A
R1206	A	D	5A
R1207	A	D	4A
R1209	A	D	3B
R1211	A	D	2B
R1214	A	D	2A
R1215	A	D	2A
R1216	A	D	2A
R1217	A	D	9A
R1218	A	D	8A
R1219	A	D	1B
R1220	A	D	1B
R1221	A	D	9B
R1222	A	D	2A
R1223	A	D	2A
R1224	A	D	2A
R1227	A	D	3A
R1251	A	D	11A
R1252	A	D	11A
SWITCH			
S1201	A	D	9B
S1202	A	D	10B
S1203	A	D	11B
S1204	A	D	10B
S1205	A	D	11B
S1206	A	D	8A
S1207	A	D	9B
S1208	A	D	8A
S1209	A	D	3A
S1210	A	D	3A
S1211	A	D	1A
S1212	A	D	1A
S1214	A	D	2A
S1215	A	D	10B
S1216	A	D	1A
S1220	A	D	11B
TEST POINT			
TP1201	A	D	1A
TP1202	A	D	2A
OTHER			
DI1201	A	D	6A
FW1202	A	D	2B
J1201	A	D	11A
J1202	A	D	11A
J1203	A	D	10A

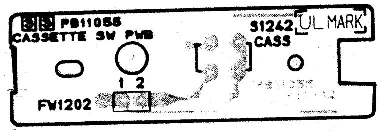
— JOG —


R1297
3 7
UL MARK
CN1205
PB11055
JOG PWB
UN1291 PB11055 -01-02
A
B1295
B1296

— CASSETTE SW —


S1241 REC SAFE
UL MARK
3 2
FW1201
PB11055 REC SAFETY PWB

— REC SAFETY —


PB11055 CASSETTE SW PWB
S1242 CASS
UL MARK
FW1202

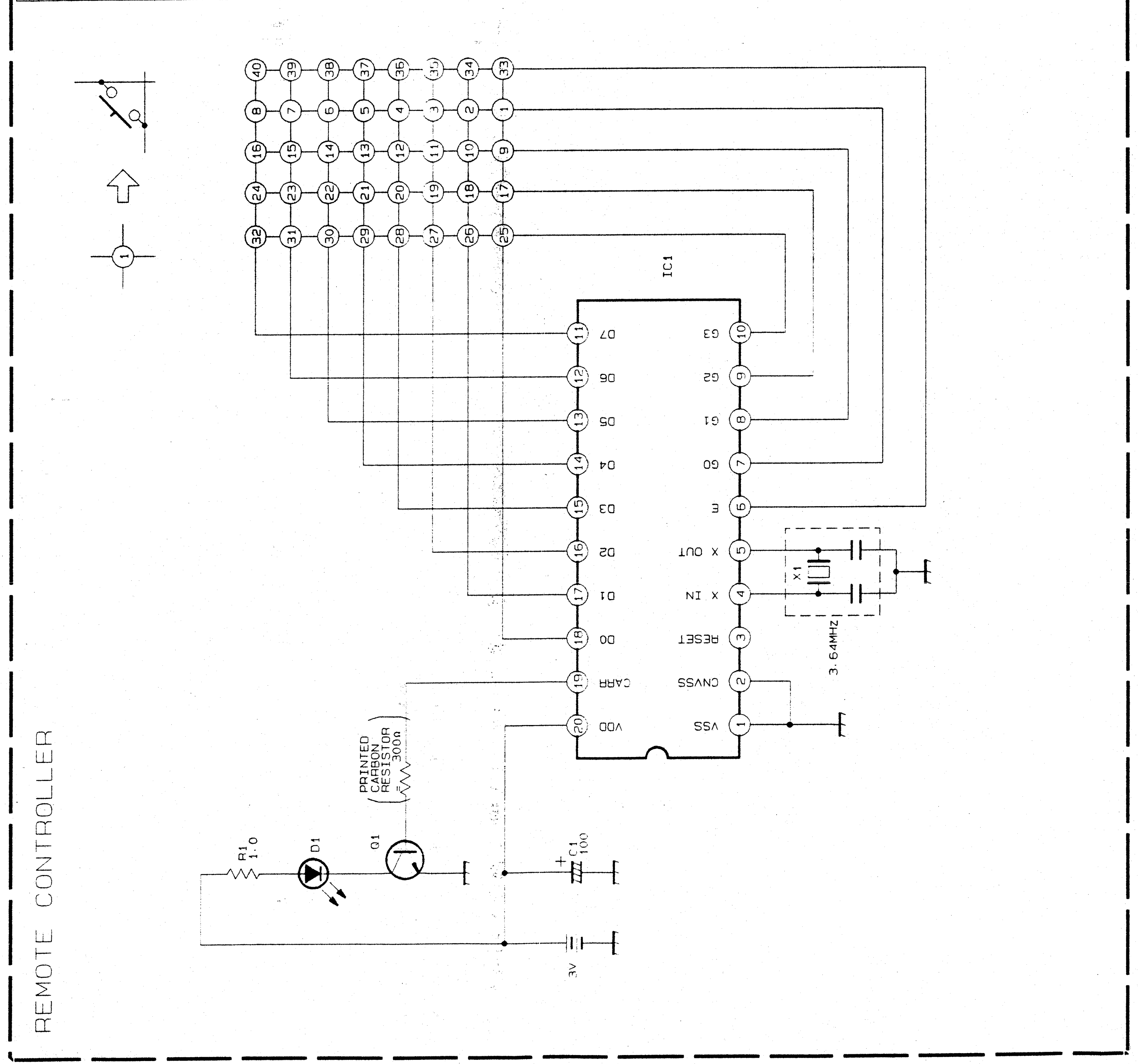
4.17 REMOTE CONTROL SCHEMATIC DIAGRAM

— HR-J248E —

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	TV
2	DISPLAY
3	TV/VCR
4	OPERATE
5	1
6	2
7	3
8	RE-VIEW
9	4
10	5
11	6
12	AUDIO MONITOR
13	7
14	8
15	9
16	CANCEL
17	PRG CHECK
18	0
19	-/--
20	. TIMER
21	START +
22	STOP +
23	DATE +
24	TV PROG +
25	START -
26	STOP -
27	DATE -
28	TV PROG -
29	REW
30	PLAY
31	FF
32	REC
33	STOP
34	PAUSE
35	PROG/MENU
36	OK
37	PUSH JOG <<
38	CURSOR +/TV VOL +
39	PUSH JOG >>
40	SURSOR -/TV VOL -
32+30	REC START
32+34	REC PAUSE
1+3	TV TV/VCR
1+4	TV OPERATE
1+12	TV MUTE
1+19	TV MAIN/SUB
1+24	TV PRG+
1+28	TV PRG-
1+38	TV VOL+
1+40	TV VOL-

BZ013869-01

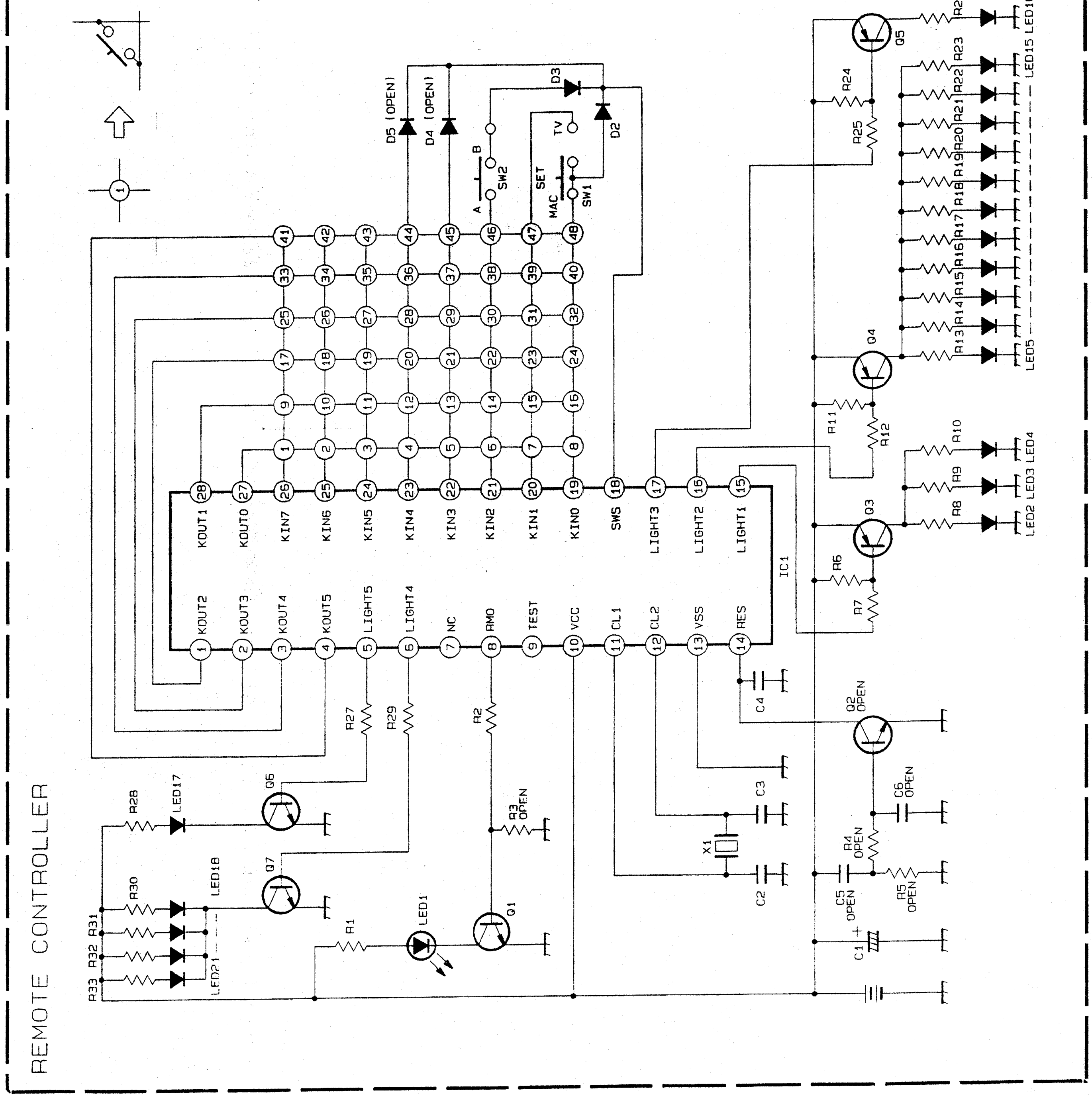

IC1
D7
D6
D5
D4
D3
D2
D1
D0
CARR
VDD
G3
G2
G1
G0
E
X OUT
X IN
RESET
CNVSS
VSS
X1
3.64MHZ
PRINTED CARBON RESISTOR 300Ω
R1 1.0
D1
Q1
C1 100
3V
REMOTE CONTROLLER

— HR-E249E —

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	PUSH JOG >>
2	-
3	R.A.EDIT
4	SCENE FINDER
5	PROG CHECK
6	7
7	8
8	9
9	ILLUMI GUIDE
10	TV PROG+
11	CURSOR+/TV VOL+
12	PROG/MENU
13	OK
14	CANCEL
15	0
16	TIMER
17	OPERATE
18	-
19	AUDIO MONITOR
20	-/--
21	TV/VCR
22	RE_VIEW
23	CH SEARCH
24	CH STORE
25	STOP-
26	DATE+
27	DATE-
28	START-
29	TV PROG-
30	C.MEMORY
31	DISPLAY
32	SPATIALIZER
33	START+
34	PUSH JOG >>
35	PLAY
36	REW
37	FF
38	1
39	2
40	3
41	CURSOR-/TV PROG-
42	STOP+
43	STOP
44	REC
45	PAUSE
46	4
47	5
48	6
44+35	REC START
44+45	REC PAUSE

PEAC0505

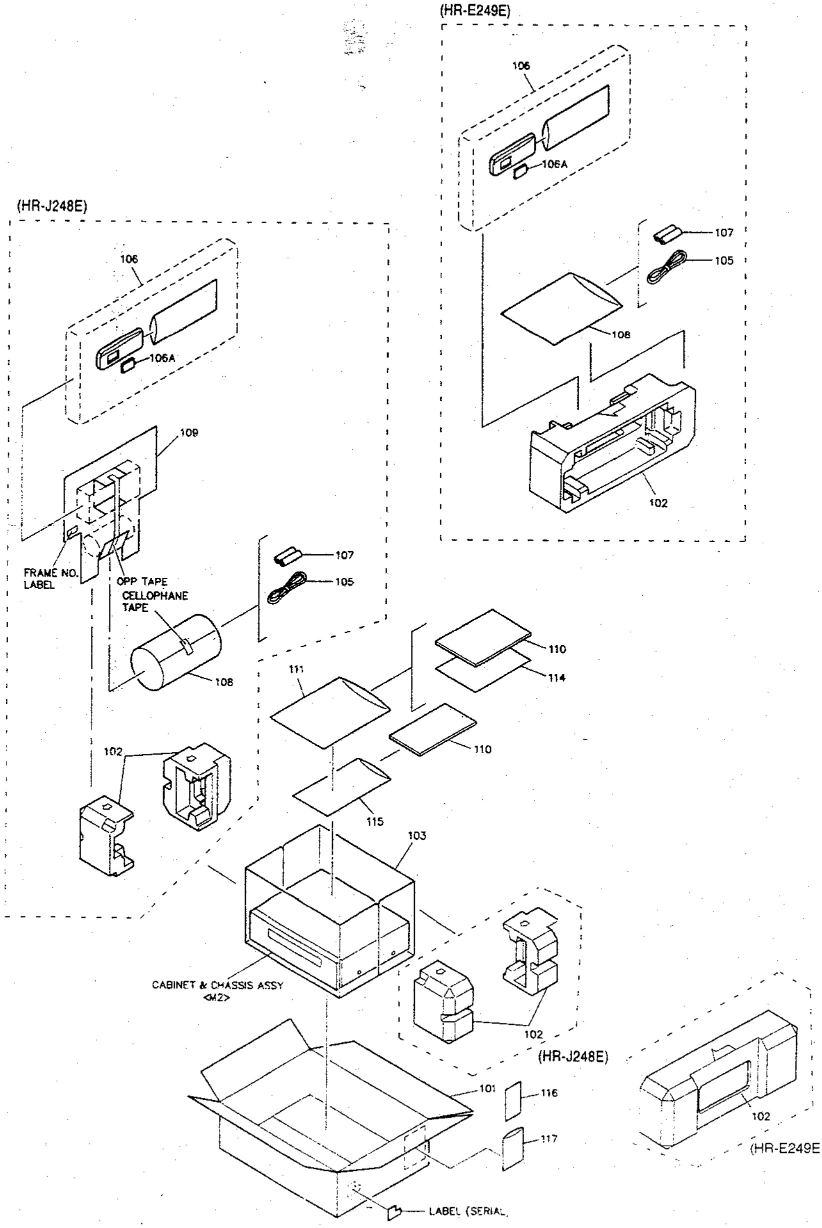

IC1
KOUT1
KOUT0
KIN7
KIN6
KIN5
KIN4
KIN3
KIN2
KIN1
KIN0
SWS
LIGHT3
LIGHT2
LIGHT1
KOUT2
KOUT3
KOUT4
KOUT5
LIGHT5
LIGHT4
NC
RMO
TEST
VCC
CL1
CL2
VSS
RES
D5 (OPEN)
D4 (OPEN)
D3
D2
SW1
SW2
A
B
SET
MAC
TV
Q1
Q2 OPEN
Q3
Q4
Q5
Q6
Q7
X1
C1
C2
C3
C4
C5 OPEN
C6 OPEN
R1
R2
R3 OPEN
R4 OPEN
R5 OPEN
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
R25
R26
R27
R28
R29
R30
R31
R32
R33
LED1
LED2
LED3
LED4
LED5
LED15
LED16
LED17
LED18
LED21
REMOTE CONTROLLER

SECTION 5
PARTS LIST

SAFETY PRECAUTIONS

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

PACKING AND ACCESSORY ASSEMBLY <M1>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		101	LP30155-011A	PACKING CASE,J248E
			LP30183-003A	PACKING CASE,E249E
		102	LP30124-001A	CUSHION ASSEMBLY,J248E
			LP30182-001A	CUSHION ASSEMBLY,E249E
		103	PQM30021-93	POLY BAG,J248E
			PQM30021-95	POLY BAG,E249E
		105	PEAC0300-02	RF CABLE
		106	LP20106-002B	REMOTE CONTROLLER,J248E
			PQ21953S	REMOTE CONTROLLER,E249E
		106A	LP40074-001A	BATTERY CASE,J248E
			PQ46614-2	COVER(BATTERY),E249E
		107	R6PRPA-2ST	BATTERY,X2
		108	QPC022002215P	POLY BAG
		109	PQ35575-1-1	SHEET,REMOTE CONTROLLER,J248E
	⚠	110	LPT0002-097A	INST BOOK(EN),J248E
	⚠		LPT0002-098A	INST BOOK(GE),J248E
	⚠		LPT0002-099A	INST BOOK(FR),J248E
	⚠		LPT0002-0A1A	INST BOOK(IT),J248E
	⚠		LPT0002-0A2A	INST BOOK(SP),J248E
	⚠		LPT0002-0A3A	INST BOOK(DU),J248E
	⚠		LPT0002-0A4A	INST BOOK(DA),J248E
	⚠		LPT0002-0A5A	INST BOOK(FI),J248E
	⚠		LPT0002-0A6A	INST BOOK(SW),J248E
	⚠		LPT0002-0A7A	INST BOOK(NO),J248E
	⚠		LPT0002-0A8A	INST BOOK(PT),J248E
	⚠		LPT0002-0A9A	INST BOOK(GR),J248E
	⚠		LPT0002-058A	INST BOOK(EN),E249E
	⚠		LPT0002-059A	INST BOOK(GE),E249E
	⚠		LPT0002-060A	INST BOOK(FR),E249E
	⚠		LPT0002-061A	INST BOOK(IT),E249E
	⚠		LPT0002-062A	INST BOOK(SP),E249E
	⚠		LPT0002-063A	INST BOOK(DU),E249E
	⚠		LPT0002-064A	INST BOOK(DA),E249E
	⚠		LPT0002-065A	INST BOOK(FI),E249E
	⚠		LPT0002-066A	INST BOOK(SW),E249E
	⚠		LPT0002-067A	INST BOOK(NO),E249E
	⚠		LPT0002-068A	INST BOOK(PT),E249E
	⚠		LPT0002-069A	INST BOOK(GR),E249E
		111	QPC02503515P	POLY BAG
		114	PQ45146-113	SHEET(SPAIN),J248E
			PQ45146-115	SHEET(SPAIN),E249E
		115	QPC02503515P	POLY BAG
		116	BT-20135	WARRANTY CARD
		117	PQ33909	POLLY BAG

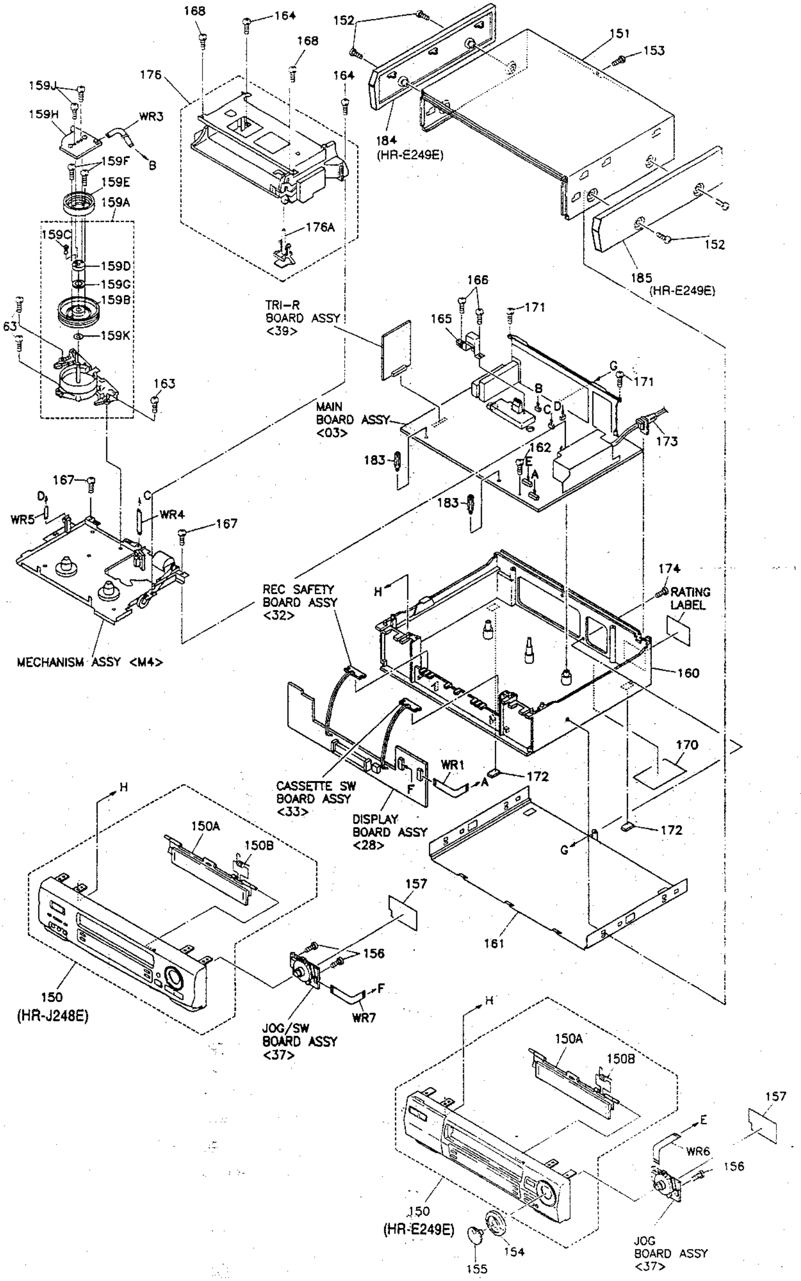
* INST BOOKS

EN .... ENGLISH
GE .... GERMANY
FR .... FRENCH
IT .... ITALIAN
SP .... SPANISH
DU .... DUTCH
DA .... DANISH
FI .... FINNISH
SW .... SWEDISH
NO .... NORWEGIAN
PT .... POLISH
GR .... GREEK

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.


168
164
152
151
153
168
164
176
159J
159H
WR3
B
159F
159E
159A
159C
159D
159G
159B
159K
163
163
184
(HR-E249E)
176A
152
185
(HR-E249E)
166
165
171
TRI-R
BOARD ASSY
<39>
G
171
B
C
D
MAIN
BOARD ASSY
<03>
162
E
A
173
183
183
167
D
C
WR5
WR4
167
MECHANISM ASSY <M4>
REC SAFETY
BOARD ASSY
<32>
H
174
RATING
LABEL
160
170
CASSETTE SW
BOARD ASSY
<33>
WR1
A
172
F
DISPLAY
BOARD ASSY
<28>
G
172
H
150A
150B
157
156
F
WR7
161
150
(HR-J248E)
JOG/SW
BOARD ASSY
<37>
H
150A
150B
157
E
WR6
156
150
(HR-E249E)
154
155
JOG
BOARD ASSY
<37>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	150	LP10018-007B	FRONT PANEL ASSEMBLY,J248E
		LP10033-002A	FRONT PANEL ASSEMBLY,E249E
	150A	PQ21884-35	CASSETTE DOOR,E249E
		PQ21884-41	CASSETTE DOOR,J248E
	150B	PQ46448	TORSION SPRING
⚠	151	PQ11676-7	TOP COVER,J248E
⚠		PQ11676-9	TOP COVER,E249E
	152	SDSF3010M	SCREW,X4 (SIDE) J248E
		PQ43930	SPECIAL SCREW,X4 (SIDE) E249E
	153	SDSF3010M	SCREW,(REAR)
	154	LP30120-002A	KNOB SHUTTLE,E249E
	155	LP30121-002A	KNOB JOG,E249E
	156	SDSF2608Z	SCREW,X2 JOG/SW J248E
		SDSF2608Z	SCREW,X1 JOG E249E
	157	LP40141-001A	SPACER
	159A	LP20083-003A	DRUM SUB ASSEMBLY
	159B	LP20084-003A	UPPER DRUM ASSEMBLY
	159C	LP40025-001A	BRUSH ASSEMBLY
	159D	LP40028-001A	COLLAR ASSEMBLY
	159E	PDZ0179	ROTOR ASSEMBLY
	159F	SPSP3006Z	SCREW,X2
	159H	PDZ0181	STATOR ASSEMBLY
	159J	SPSP2606Z	SCREW,X2
	159K	PDM4444-19-2	WASHER
⚠	160	PQ11666-3-14	BOTTOM CHASSIS
⚠	161	PQ11668-2	BOTTOM COVER
	162	SDSF3010Z	SCREW,MAIN BOARD
	163	SPST2608Z	SCREW,X3 DRUM
	164	SPST2606Z	SCREW,X2 CASS HOUS ASSY
	165	LP30131-001A	SHIELD COVER,PRE
	166	SDST2606Z	SCREW,X2 PRE
	167	SDSF4012Z	SCREW,X2 MECH
	168	SDSF3010Z	SCREW,X2 CASS HOUS ASSY
⚠	170	PQ46485	SPACER(SAFETY)
	171	SDSF3010Z	SCREW,X2 TERMINAL
	172	PQ43013-3	FOOT,X2
⚠	173	QMP4A10-170	POWER CORD
	174	SDSF3010M	SCREW,TERMINAL
	176	PUS29724E	CASSETTE HOUSING ASSY
	176A	PQ46359-1-1	CASSETTE SWITCH PIN
	183	PEME0947-01-01	SPACER,X2 MECH
	184	LP30153-001A	SIDE PANEL(L) ASSEMBLY,E249E
	185	LP10036-001	SIDE PANEL(R),E249E
	WR1	PW30802-1214	WIRE, DISP/SW
	WR3	PW30803-0414	WIRE, DRUM
	WR4	PW30101-C0HH887	WIRE,A/C HEAD
	WR5	PW30101-P0HH882	WIRE,FE HEAD
	WR6	PW30802-0614	WIRE,JOG/SW J248E
	WR7	PW30802-0818	WIRE,JOG E249E

Safety Precautions

1. The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorised in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits.
2. Any unauthorised design alterations or additions will void the manufacturer's guarantee ; furthermore the manufacturer cannot accept responsibility for personal injury or property damage resulting therefrom.
3. Essential safety critical components are identified by (⚠) on the Parts List and by shading on the schematics ,and must never be replaced by parts other than those listed in the manual. Please note however that many electrical and mechanical parts in the product have special safety related characteristics. These characteristics are often not evident from visual inspection. Parts other than specified by the manufacturer may not have the same safety characteristics as the recommended replacement parts shown in the Parts List of the service manual and may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been returned to normal, after re-assembling.

Warning

1. Service should be performed by qualified personnel only.
2. This equipment has been designed and manufactured to meet international safety standards.
3. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
4. Repairs must be made in accordance with the relevant safety standards.
5. It is essential that safety critical components are replaced by approved parts.
6. If mains voltage selector is provided, check setting for local voltage.

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5. PARTS LIST

5.1 PACKING AND ACCESSORY ASSEMBLY<M1> 5-1
5.2 CABINET AND CHASSIS ASSEMBLY <M2> 5-2
5.3 MECHANISM ASSEMBLY <M4> 5-4
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MAIN BOARD ASSEMBLY <03> 5-6
AUDIO/CONTROL HEAD BOARD ASSEMBLY <12> 5-12
DISPLAY/BOARD ASSEMBLY <28> 5-12
REC SAFETY BOARD ASSEMBLY <32> 5-13
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6. TECHNICAL INFORMATION

6.1 SYSCON CIRCUIT 6-1

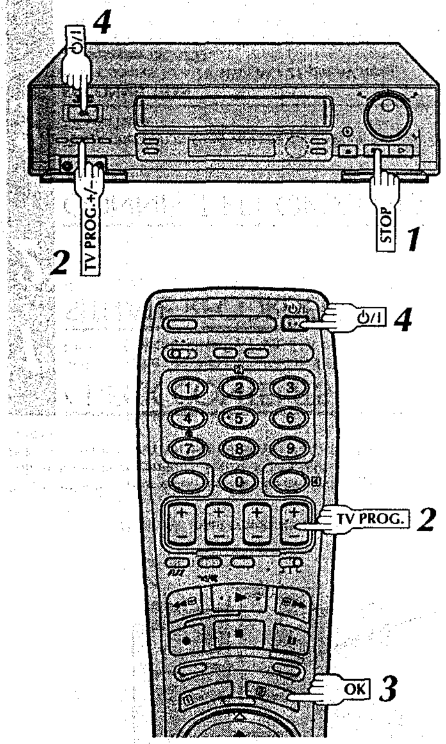
The following table lists the differing points between Models (HR-J245EK and HR-J249EK) in this series.

	HR-J245EK	HR-J249EK
JOG SHUTTLE SWITCH	×	○
AUTO SP/LP TIMER	×	○
SCENE FINDER	×	○
TRI-R CIRCUIT	×	○
REMOCON(TV/SAT MBR)	×	○

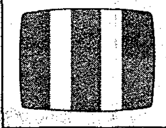
NOTE: ○ USED × NOT USED

Video Channel Set

Video Channel (RF Output Channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.



TEST SIGNAL



The channel on which the screen to the left appear clearly in step 2 is your Video Channel.

To view picture signals from the video recorder, set your TV to the Video Channel.

If you have connected the video recorder to your TV via the provided RF cable only (RF connection) – Go to "With RF Connection" below.

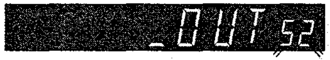
If you have connected the video recorder to your TV via both the provided RF cable and a 21-pin SCART cable (AV connection) – Go to "With AV Connection" on next page.

IMPORTANT:
Before performing the following steps, make sure the recorder's power is off and there is no cassette inserted in the recorder.

With RF Connection

1 ACCESS VIDEO CHANNEL SET MODE

Hold down **STOP** on the recorder until the display panel shows the following.

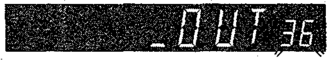


2 SET VIDEO CHANNEL

Set your TV to UHF channel 52.

- If the two vertical white bars appear clearly on the screen as shown in the illustration at bottom left, go to step **3**.
- If the two vertical white bars do not appear clearly, press **TV PROG.+** or **–** to set the video recorder to a vacant channel between 22 and 69 which is not occupied by any local station in your area.

(Ex.) If channel 36 is available in your area



Then set your TV to UHF channel 36 and check if the two vertical white bars appear clearly on the screen; if so, go to step **3**. If not, re-set the video recorder to another vacant channel and try again.

NOTES:

- *If you set the video recorder to a channel which is occupied by a local station or has neighbouring channels that are occupied by local stations, the picture reception quality will be affected and some interference noise will appear on the TV screen. Be sure to select a vacant channel which has no broadcast on neighbouring channels.*
- *If you cannot obtain the two vertical white bars clearly with any channel between 22 and 69, consult your JVC dealer.*

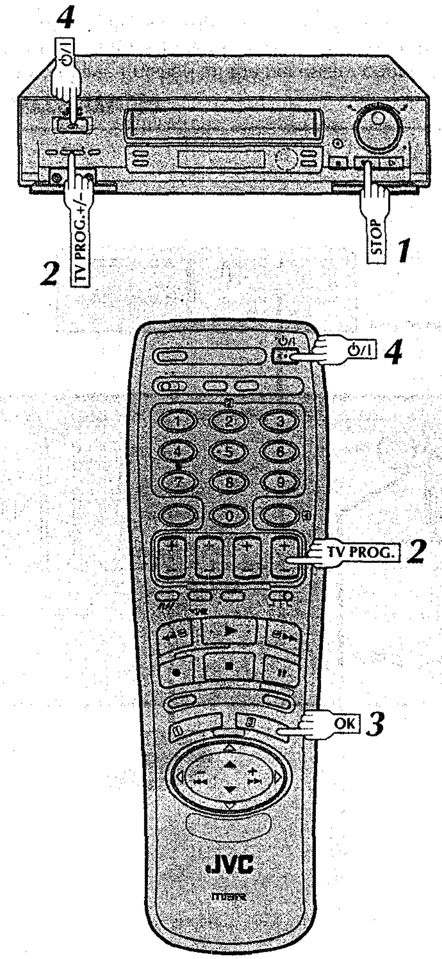
3 EXIT VIDEO CHANNEL SET MODE

Press **OK**.

4 TURN OFF THE RECORDER

Press ⏻/I.

After you finish this step, go to "Auto Set Up" on page 8.

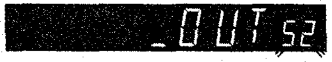


IMPORTANT:
Before performing the following steps, make sure the recorder's power is off and there is no cassette inserted in the recorder.

With AV Connection

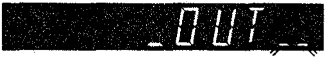
1 ACCESS VIDEO CHANNEL SET MODE

Hold down **STOP** on the recorder until the display panel shows the following.



2 SET VIDEO CHANNEL

Press **TV PROG. –** until the display panel shows "_OUT_ _".



- Now the video channel is set to off.

3 EXIT VIDEO CHANNEL SET MODE

Press **OK**.

4 TURN OFF THE RECORDER

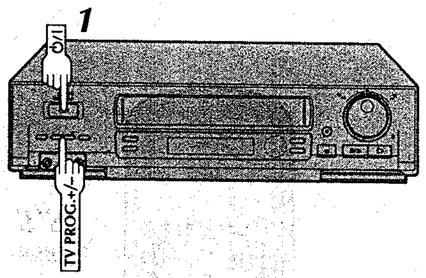
Press ⏻/I.

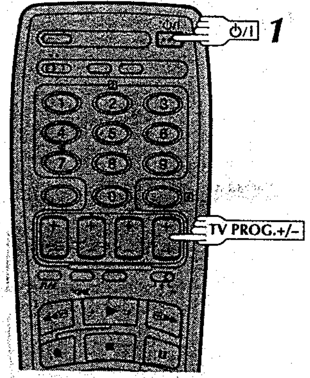
To view picture signals from the video recorder, set your TV to its AV mode.

After you finish this step, go to "Auto Set Up" on page 8.

Auto Set Up

Auto Channel Set/Auto Clock Set/Auto Guide Program Number Set





The Auto Set Up function sets the tuner channels, clock and Video Plus+ assigned Guide Program numbers automatically when the ⏻/I button on the recorder/remote is first pressed to power on the recorder after you plug the mains power cord into a mains outlet.

Before starting the following procedure, make sure that the TV aerial cable is connected to the recorder and that the recorder's mains power cord is connected to a mains outlet (☞ pg.4).

1 PERFORM AUTO SET UP

Press ⏻/I on the recorder or remote control.

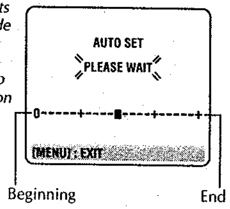
"Auto" appears on the display panel and blinks; do NOT press any button on the recorder or remote control until the display panel shows the current time or "CH1" or "--:--".

- Auto channel set function takes place first; it assigns automatically all receivable stations in your area.
- Auto clock set function sets the clock automatically by reading the clock setting data from a station transmitting a PDC signal while auto channel set is being performed.
- During auto channel set, the recorder recognizes each station name of the detected stations and stores them in the recorder's memory, then automatically sets Video Plus+ assigned Guide Program number for those stations according to the broadcast area.

IMPORTANT

- Depending on the reception conditions, the station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, Video Plus+ timer recording (☞ pg. 22) will not work correctly; be sure to check if the Guide Program numbers have been set correctly (☞ pg.10, "Video Plus+ Setup").
- Since your video recorder memorizes all detected stations even if the reception condition is poor, some of those stored stations may produce a noisy picture. To delete those stations, ☞ "Delete A Channel" on page 41.

NOTES:



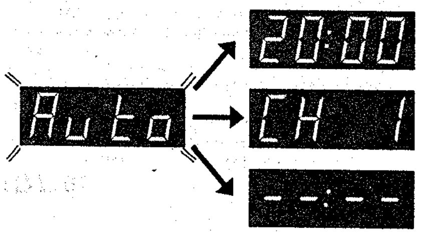
- *If the TV power is on and its VIDEO channel or AV mode is selected during Auto Set Up, the AUTO SET screen will appear. As Auto Set Up progresses, the "■" mark on the screen moves from left to right.*
- *If there is a power cut, or if you press ⏻/I or **MENU** while Auto Set Up is in progress, Auto Set Up will be interrupted; be sure to turn off the recorder power once and press ⏻/I to turn the power back on to re-start Auto Set Up.*

ATTENTION

Once you have performed Auto Set Up, even if the recorder's memory backup has expired, all the stored stations and their Guide Program numbers remain in the recorder's memory and the recorder will not perform Auto Set Up again. You only need to set the clock. (☞ pg. 46)

If you have moved to a different area, perform each setting as required.
- Tuner setting ☞ pg. 38
- Clock setting ☞ pg. 46
- Video Plus+ Guide Program number setting ☞ pg. 10

If a new station starts broadcasting in your area, perform both tuner setting (☞ pg. 38) and Video Plus+ Guide Program number setting (☞ pg. 10).



- When both auto channel set and auto clock set have been completed successfully the correct current time will be displayed.
- When auto channel set has been completed successfully but auto clock set has not, "CH" will be displayed.
- When neither auto channel set nor auto clock set has been completed successfully, "--:--" will be displayed.

* See "Video Plus+ Setup" on page 10 to check if the Guide Program numbers have been set correctly.

If both auto channel set and auto clock set have been performed successfully:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG.** button(s).
- If station names (ID — ☞ pg. 44) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds when the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 40 – 43.

2 Perform "Video Plus+ Setup" on page 10 to check if the Guide Program numbers have been set correctly.

If auto channel set has succeeded but auto clock set has not:

1 Turn on the TV and select its VIDEO channel or AV mode, then make sure that all necessary stations have been stored in the recorder's memory by using the **TV PROG.** button(s).
- If station names (ID — ☞ pg. 44) have also been stored in the recorder's memory, the station name will be displayed at the top left corner of the screen for about 5 seconds when the recorder is tuned to a different station.
- If you want to set the tuner manually such as to add or skip channels, to change preset positions, or to set or change station names, see pages 40 – 43.

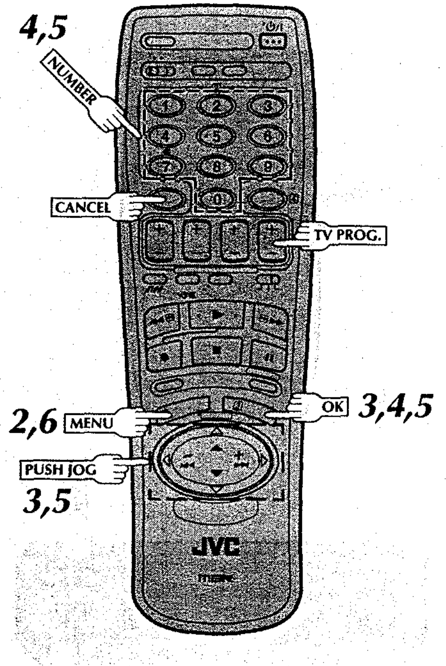
2 Perform "Clock Set" on page 46, then "Video Plus+ Setup" on page 10 to check if the Guide Program numbers have been set correctly.

If both auto channel set and auto clock set have failed:

1 Make sure the TV aerial cable is connected properly to the recorder and turn off the recorder power once, then turn the recorder power back on again.
- The recorder will try Auto Set Up again.

Video Plus+ Setup

Turn on the TV and select the VIDEO channel (or AV mode).


4,5
NUMBER
CANCEL
TV PROG.
2,6
MENU
OK
3,4,5
PUSH JOG
3,5
JVC

With Video Plus+, timer programming is greatly simplified because each TV programme has a corresponding code number which your recorder is able to recognise.

NOTE:

"Guide Program (GUIDE PROG.) number" refers to the assigned TV station numbers, according to broadcast area, for Video Plus+ timer recording.

IMPORTANT

Perform the following procedure after Auto Set Up on page 8 and/or the channel setting steps on pages 38 – 43, and after the Clock Set procedure on page 46.
After setting the Guide Program numbers, the station names and preset positions may be incorrect if you stored or skipped channels. In this case, re-perform Guide Program number setting.

Perform the following steps to check if the Guide Program numbers have been correctly set during Auto Set Up or Auto Channel Set, and make corrections if necessary.

Guide Program Number Set

1 MAKE LIST OF STORED STATION NAMES AND PRESET POSITIONS

(Ex.)

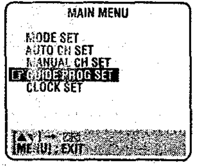
Preset position	Station name
1	BBC1
2	BBC2
3	ITV
4	CH4
5	CH5

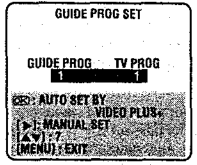
2 ACCESS MAIN MENU SCREEN

Press MENU twice.

3 ACCESS GUIDE PROG SET SCREEN

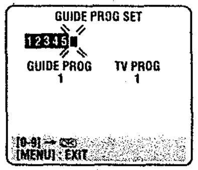
Press **PUSH JOG** ∆∇ to move the highlight bar (pointer) to "GUIDE PROG SET", then press **OK**.
The Guide Prog. Set screen appears.


MAIN MENU
MODE SET
AUTO CH SET
MANUAL CH SET
GUIDE PROG SET
CLOCK SET
[▲▼] → OK
[MENU] : EXIT


GUIDE PROG SET
GUIDE PROG
TV PROG
1
1
OK : AUTO SET BY VIDEO PLUS+
[▶] : MANUAL SET
[▲▼] : ?
[MENU] : EXIT

4 ENTER PLUSCODE NUMBER

Press **OK**, and a cursor appears above "GUIDE PROG". Then, using the **NUMBER** keys, input the PlusCode number (found in most TV listings) of a program scheduled to be broadcast on each station on the list from step **1**, starting at the top. If you enter the wrong-number, press **CANCEL** to backspace and input the correct number.

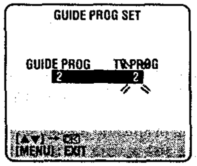

GUIDE PROG SET
12345
GUIDE PROG
TV PROG
1
1
[0-9] → OK
[MENU] : EXIT

When entering a PlusCode for BBC 2

5 CONFIRM PRESET POSITION NUMBER

Press **OK** and the display under "TV PROG" begins blinking.

If the blinking number under "TV PROG" agrees with the preset position . . .
. . . press **OK**.
If the numbers do not agree . . .
. . . input the preset position using **PUSH JOG**∆∇ or the **NUMBER** keys, then press **OK**.


GUIDE PROG SET
GUIDE PROG
TV PROG
2
2
[▲▼] → OK
[MENU] : EXIT

- If you input the PlusCode number of a program that has already aired, "ERROR" appears on screen for a few seconds. Input the correct PlusCode number.
- Repeat steps **4** and **5** as necessary.

6 CLOSE MENU

Press **MENU** and selection is complete.

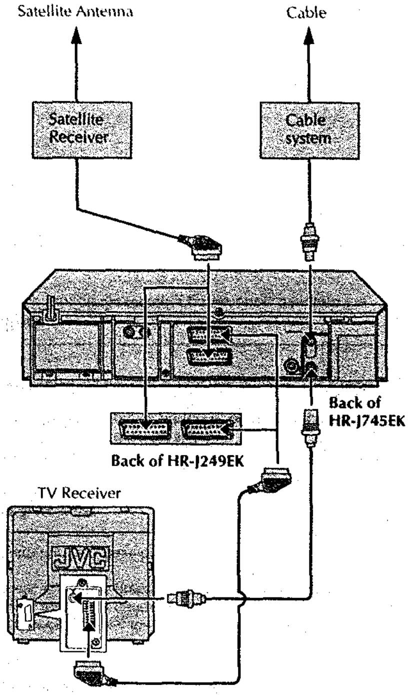
If you already know the Guide Program number for a station . . .
1– After step **3**, press **PUSH JOG** ▷.
  - The GUIDE PROG number begins blinking.
2– Enter the Guide Program number using the **NUMBER** keys or **PUSH JOG**∆∇, then press **PUSH JOG** ▷.
  - The TV PROG number begins blinking.
3– Enter the preset position using the **NUMBER** keys or **PUSH JOG**∆∇, then press **PUSH JOG** ◁.
  - Repeat **2** and **3** as necessary.
4– Press **MENU**.

NOTES:

- *If you own a satellite receiver, connect it to the AV2 IN connector on the back of the recorder. Then, in step 5 above, set the input mode to "AUX2" by pressing **NUMBER** key "0" or **TV PROG. +/–**.*
- *If you're receiving broadcasts via a cable box through preset "6" (example) on your recorder, set "TV PROG" for "6" in step 5.*
- *After selecting the programme you wish to record from your cable system or satellite receiver, set the system's timer — if your cable or satellite receiver does not have a timer, leave it switched on.*

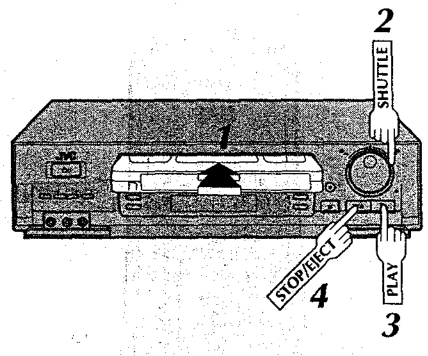
When Using A Satellite Receiver And/Or Cable System

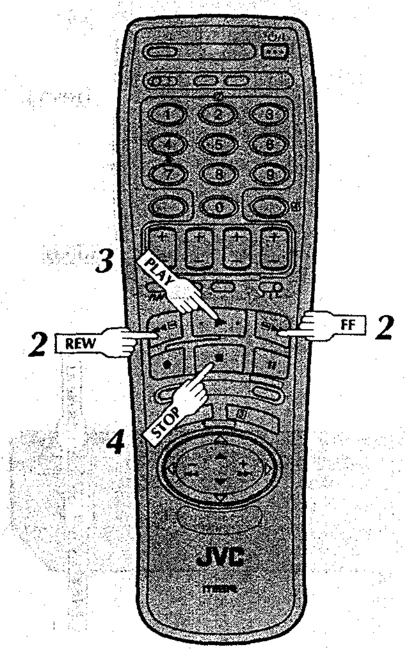
THE SATELLITE RECEIVER IS SHOWN CONNECTED TO THE "AV2 IN" (SCART) CONNECTOR AND THE CABLE SYSTEM CONNECTED VIA THE AERIAL SOCKET AND TUNED TO, FOR EXAMPLE, PRESET POSITION 6 ON YOUR TV.


Satellite Antenna
Cable
Satellite Receiver
Cable system
Back of HR-J745EK
Back of HR-J249EK
TV Receiver
JVC

Basic Playback

Turn on the TV and select the VIDEO channel (or AV mode).





The easiest, most basic operation possible with your video recorder is tape playback. Already-recorded signals on a video tape are read by your video recorder and displayed on your TV just like a TV programme.

1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is point toward the recorder. Don't apply too much pressure when inserting.

- The recorder power comes on automatically and the counter is reset to 0:00:00.
- If the record safety tab has been removed, playback begins automatically.

2 FIND PROGRAMME START POINT

If the tape is advanced past the start point, press **REW** or turn the **SHUTTLE** ring to the left.
To go forward, press **FF** or turn the **SHUTTLE** ring to the right.

3 START PLAYBACK

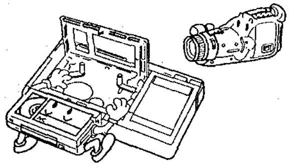
Press **PLAY**. "BEST" appears blinking in the recorder's display panel during automatic tracking (☞ pg. 20).

- Playback picture quality of LP recordings will not be as high as SP recordings.

4 STOP PLAYBACK

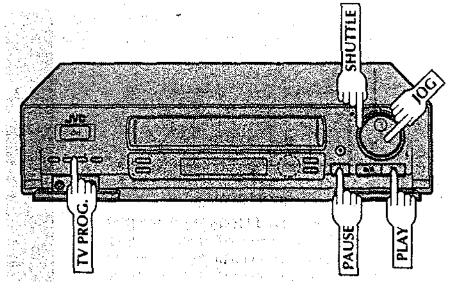
Press **STOP** on the remote or **STOP/EJECT** on the recorder's front panel. Then press **STOP/EJECT** to remove the cassette.

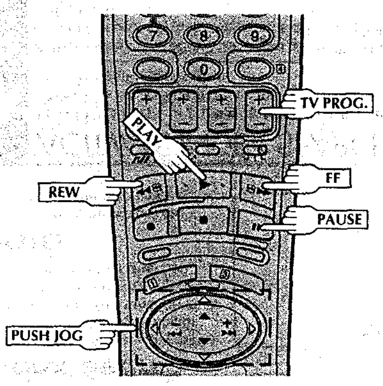
Usable cassettes



- Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.
- This video recorder can record on regular VHS and Super VHS cassettes. However, it will record and play back regular VHS signals only. It is not possible to play back a recorded Super VHS tape.

Playback Features





Variable-Speed Search

1 ACTIVATE VARIABLE-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring to the right for forward variable-speed search, or to the left for reverse variable-speed search (refer to the illustration at top right).

OR

During playback, press **PUSH JOG** ◁ or ▷.

- The more times you press, the faster the playback picture moves.
- To decrease speed, press the button for the opposite direction.

To resume normal playback, press **PLAY**.

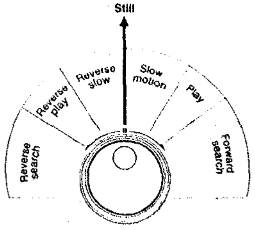
NOTE:

In the search, still, or frame by frame playback mode, the picture may be distorted, and there may be a loss of colour.

Take advantage of special functions possible with the recorder's controls or the remote control.

NOTE:

Refer to the ***SHUTTLE*** *ring illustration below as you read the following procedures.*



Still Picture/Frame-By-Frame Playback

1 PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **TV PROG.** buttons to correct the picture.

2 ACTIVATE FRAME-BY-FRAME PLAYBACK

Turn the **JOG** dial to the right for forward frame-by-frame playback, or to the left for reverse frame-by-frame playback.

OR

Press **PAUSE**.

OR

Press **PUSH JOG** ◁ or ▷.

To resume normal playback, press **PLAY**.

Slow Motion

1 ACTIVATE SLOW-MOTION PLAYBACK

During playback or still picture, turn the **SHUTTLE** ring to the right for forward slow motion, or to the left for reverse slow motion (refer to the illustration above).

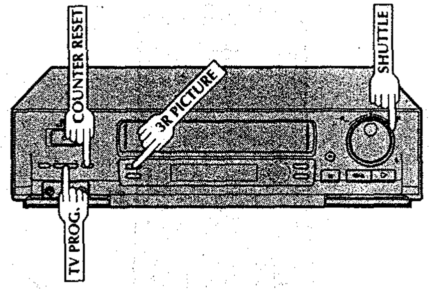
OR

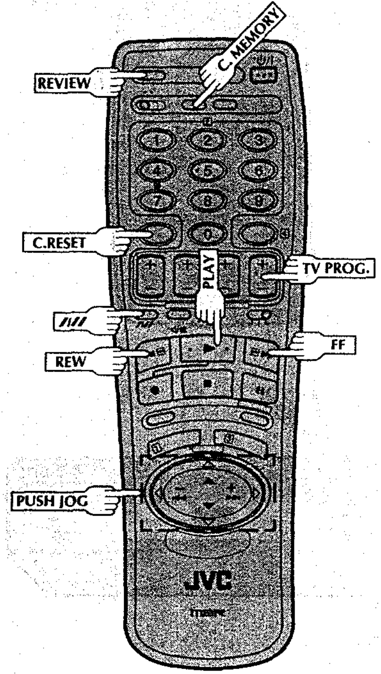
During still picture, press and hold **PAUSE** for 2 seconds, then release. Press and release again to return to still picture.

OR

During still picture, press and hold **PUSH JOG** ◁ or ▷. Release to return to still picture.

To resume normal playback, press **PLAY**.





High-Speed (Turbo) Search

1

ACTIVATE HIGH-SPEED SEARCH

During playback or still, turn the **SHUTTLE** ring all the way to the right for forward high-speed search, or to the left for reverse high-speed search. Releasing **SHUTTLE** resumes still picture playback.

OR

- For forward high-speed search, turn the **SHUTTLE** ring all the way to the right and release it within 1 second.
- For reverse high-speed search, turn the **SHUTTLE** ring all the way to the left and release it within 1 second.

OR

Press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

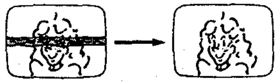
To resume normal playback, press **PLAY**.

NOTES:

- *For short searches, press and hold* **FF** *or* **REW** *for over 2 seconds. When released, normal playback resumes.*
- *In the search, still, or frame by frame playback mode, the picture may be distorted, and there may be a loss of colour.*

Manual Tracking

Your video recorder is equipped with automatic tracking control. During playback, you can override this and adjust the tracking manually by pressing the **TV PROG.** buttons.



1

OVERRIDE AUTOMATIC TRACKING

Press **/III** on the remote to engage manual tracking.

2

ADJUST TRACKING MANUALLY

Press **TV PROG.** + or – to adjust tracking.

3

RETURN TO AUTOMATIC TRACKING

Press **/III** on the remote to re-engage automatic tracking.

NOTE:

When a new tape is inserted, the recorder enters the automatic tracking mode automatically.

3R Picture

3R(= Resolution and Response Recovery technology) maximises sense of resolution and sharpens image edges to make playback picture look better focused.

1

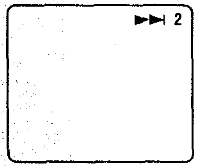
ACTIVATE 3R PICTURE

Press **3R PICTURE**. The button will light.

- To turn off 3R Picture, press **3R PICTURE** again so that the light goes off.
- Normally it is recommendable to keep 3R Picture ON (with the button lit).
- Depending on the type of tape used, picture quality may be better with 3R Picture set to off.
- If you use this recorder as the player for editing, be sure to turn off 3R Picture before starting.
- The setting will remain effective even though you turn on/off the recorder.

Index Search

Your recorder automatically marks index codes at the beginning of each recording. This function gives you quick access to any one of 9 index codes in either direction.



NOTE:

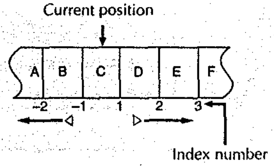
Before starting, make sure the recorder is in the Stop mode.

1

ACTIVATE INDEX SEARCH

Press **PUSH JOG** ◁ or ▷ (|◄◄ or ►►|). "|◄◄ 1" or "►►| 1" is displayed on screen and search begins in the corresponding direction.

- To access index codes 2 through 9, press **PUSH JOG** ◁ or ▷ repeatedly until the correct index number is displayed.
  Ex.: To locate the beginning of B from the current position, press **PUSH JOG** ◁ twice.
  To locate the beginning of D from the current position, press **PUSH JOG** ▷ once.



- When the specified index code is located, playback begins automatically.

Instant ReView

Simply by pressing a single button, the recorder power comes on, rewinds, and begins playback of the last timer-recorded programme. If you have several programmes recorded, you can easily access any of them.

NOTE:

Before starting, make sure that the recorder is off and that the Timer mode is disengaged.

1

ACTIVATE INSTANT REVIEW

Press **REVIEW**. The recorder power comes on and the recorder searches for the index code indicating the start of the last timer-recorded programme. Once it's found, playback begins automatically.
The front display panel tells you how many programmes have been recorded. If you have, for example, 3 programmes, "REVIEW" and "3" appear and blink. To watch the first of the 3 programmes, press **REVIEW** three times. The recorder searches and begins playback automatically. You can access a programme as far as 9 index codes away from the current tape position.

NOTES:

- *Instant ReView is not possible while the recorder is in the Timer mode.*
- *The HR-J249EK has the* **REVIEW** *button on the recorder as well.*

Counter Memory

Returns to the counter reading of "0:00:00" to conveniently find a specific place on the tape automatically.

1

SET COUNTER MEMORY

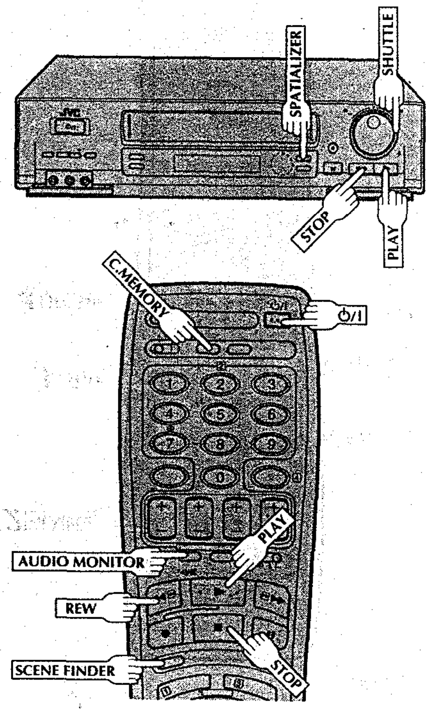
Press **C. (COUNTER) RESET** during playback at a point you wish to locate later. The counter reads "0:00:00". Then press **C.MEMORY**, and "M" appears in front of the counter digits.

2

ACTIVATE COUNTER MEMORY

When you wish to return to the designated point, press **STOP** and then **REW** or **FF**.

- The tape rewinds or fast-forwards and stops at about 0:00:00 automatically.
- To cancel Counter Memory, press **C.MEMORY** again.



Spatializer (HR-J745EK only)

This feature expands sound field when you play back any stereo source or view a stereo programme while recording it.
*Spatializer has no effect on recording quality.

1

ACTIVATE SPATIALIZER

Press **SPATIALIZER**; the current setting will be displayed on the screen for about 5 seconds. Pressing **SPATIALIZER** while the screen shows the display changes the setting.

- To view a stereo programme such as movies or music, select "SPATIALIZER ▷ ◁" to create more spacious sound.
- To view a monaural programme, select "SPATIALIZER→ST" which simulates a stereo effect.
- Select "SPATIALIZER OFF." to turn off Spatializer if the sound becomes unnatural with either "SPATIALIZER ▷ ◁" or "SPATIALIZER→ST" selected.
- The **SPATIALIZER** button lights when either "SPATIALIZER ▷ ◁" or "SPATIALIZER→ST" is selected, even though the recorder power is off.
- The setting will remain effective even though you turn on/off the recorder.

NOTE:

Spatializer is effective only with a stereo TV.

Soundtrack Selection (HR-J745EK only)

Your video recorder is capable of recording three soundtracks (HI-FI L, HI-FI R and NORM) and will play back the one you select.

During Playback
Pressing **AUDIO MONITOR** on the remote control changes the soundtrack being played back as follows:

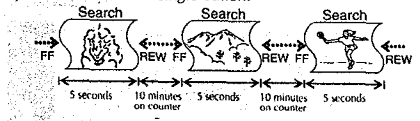
TRACK		USE
Recorder's Front Panel	On-Screen Display	
L + R	HI FI L ▷ ◁ R	For Hi-Fi stereo tapes
L	HI FI L ▷	For main audio of Bilingual tapes
R	HI FI ◁ R	For sub audio of Bilingual tapes
NORM	NORM	For audio-dubbed tapes
L + R + NORM	HI FI NORM	For audio-dubbed tapes

NOTES:

- *"L + R" should normally be selected. In this mode, Hi-Fi stereo tapes are played back in stereo, and the normal audio track is played back automatically for tapes with only normal audio.*
- *For instructions on recording NICAM stereo and bilingual programmes, refer to page 35.*
- *Bilingual programmes are not currently broadcast in the U.K.*
- *"O.S.D." must be set to "ON" or the on-screen displays will not appear (☞ pg. 34).*

Scene Finder

This function helps you check contents of unlabeled recorded tapes at the touch of a single button.



NOTE:

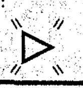
Scene Finder cannot be used when the recorder is in the Record mode.

1

ACTIVATE SCENE FINDER

Press **SCENE FINDER**. The recorder starts forward search for 5 seconds and then fast-forwards 10 minutes on the counter. This cycle is repeated until the end of the tape is reached.

- To start Scene Finder in the reverse direction, press **SCENE FINDER** and then turn the **SHUTTLE** ring to the left (or press the **REW** button) within 2 seconds. This cycle is repeated until the beginning of the tape.
- During Scene Finder, the following indications appear on the display panel:



2

STOP SCENE FINDER

Press **STOP**.

NOTES:

- *During Scene Finder search, you can also hear the tape sound. During fast forward or rewind, you hear the current TV sound instead.*
- *Scene Finder does not function during Index Search.*

Next Function Memory

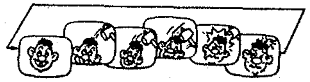
You can set your recorder's power to go off automatically after the tape is fully rewound. Before starting, make sure the recorder is in the Stop mode.
For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press ⏻/I within 2 seconds.

NOTE:

*If you want the power to be turned off automatically when the counter reads "0:00:00" (instead of at the beginning of the tape), press **C.MEMORY** so that the "M" mark appears before pressing **REW**.*

Repeat Playback

Your video recorder can automatically play back the whole tape 20 times repeatedly.



1

START PLAYBACK

Press **PLAY**.

2

ACTIVATE REPEAT PLAYBACK

Press **PLAY** and hold for over 5 seconds, then release.

- The Play indicator (▷) on the display panel blinks slowly.
- The tape plays 20 times automatically, and then stops.

3

STOP PLAYBACK

Press **STOP** at any time to stop playback.

NOTE:

*Pressing **PLAY**, **REW**, **FF** or **PAUSE** also stops Repeat Playback.*

NTSC Playback

Your video recorder is equipped with NTSC circuitry that can play back NTSC tapes.

1

LOAD A CASSETTE

Insert a cassette recorded in NTSC.

2

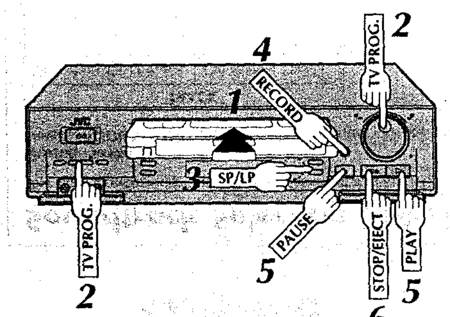
START PLAYBACK

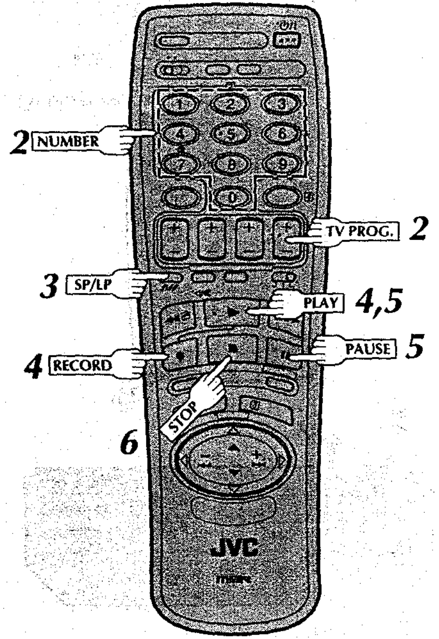
Press **PLAY**.

- "NTSC" appears on the screen for about 5 seconds.
- Some TVs shrink the picture vertically and place black bars at the top and bottom of the screen. This is not a malfunction on the part of either the video recorder or the TV.
- The picture may roll up and down. This can be corrected using the V-HOLD control found on some TVs. (This cannot be corrected if the TV does not have a V-HOLD control.)
- The counter and tape remaining time readings will be incorrect.
- During search, still, or frame-by-frame playback, the picture will be distorted, and there may be a loss of colour.
- Depending on the type of TV, the top and bottom portions of superimposed displays may be cut off during NTSC playback.

Basic Recording

Turn on the TV and select the VIDEO channel (or AV mode).





TV signals being received by the recorder's built-in tuner can be recorded onto a video tape. You can "capture" a TV programme using your video recorder.

1 LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

- The counter is reset to 0:00:00 and the recorder power comes on automatically.

2 CHOOSE A PROGRAMME

Press **TV PROG. +/–** or the **NUMBER** keys to select the preset you wish to record.

- The **TV PROG.** dial can also be used to select a preset.

3 SET TAPE SPEED

Press **SP/LP (////)**. Check the SP/LP indicator on the recorder display panel to confirm the selected tape speed.

- Picture quality of LP recordings will not be as high as SP recordings.

4 START RECORDING

Press and hold **RECORD** and **PLAY** on the remote control, or press **RECORD** on the recorder.

B.E.S.T. takes place at the beginning of both the first SP and the first LP recording after inserting the cassette (☞ pg. 20).

5 PAUSE/RESUME RECORDING

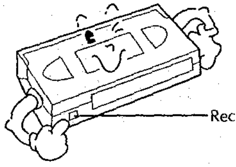
Press **PAUSE**. Press **PLAY** to resume recording.

6 STOP RECORDING

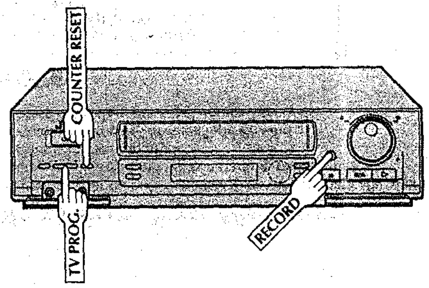
Press **STOP** on the remote control or **STOP/EJECT** on the recorder. Then press **STOP/EJECT** to remove the cassette.

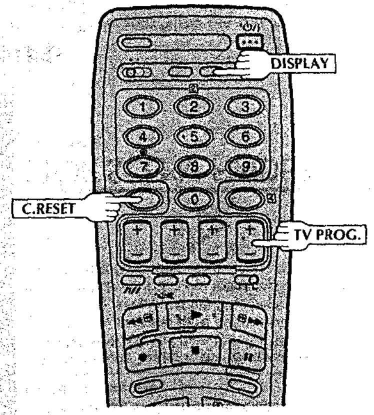
Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its safety tab. To record on it later, cover the hole with adhesive tape.



Recording Features





Tape Remaining Time

1 DISPLAY REMAINING TIME

Press **DISPLAY** until the time remaining on the tape appears.

- By pressing the **DISPLAY** button, you can change the display to show the counter reading, preset position, clock time* or tape remaining time.
  ** Preset position is not displayed during playback.*

NOTE:

Depending on the type of tape used, there may be times when the tape remaining time reading may not appear right away, or is not correct. "- - : - -" may sometimes appear, or the display may blink on occasion.

Record One Programme While Watching Another

1 SELECT PRESET TO WATCH

Once recording is in progress, all you need to do is to set the preset controls on the TV for the station you wish to view.

- The programme selected with the TV's preset controls appears on the TV screen while the one selected with the recorder's **TV PROG.** buttons is recorded on the tape.

Elapsed Recording Time Indication

You can check the exact time of a recording.

1 SET COUNTER DISPLAY

Press **DISPLAY** until a counter reading appears on the dispay panel.

2 RESET COUNTER

Press **C. (COUNTER) RESET** before starting recording or playback.

- The counter is reset to "0:00:00" and shows the exact elapsed time as the tape runs.

Instant Timer Recording (ITR)

This easy method lets you record for from 30 minutes to 6 hours (selectable in 30-min. increments), and shuts the recorder off after recording is finished.

1 START RECORDING

Press **RECORD** on the recorder.

2 ENGAGE ITR MODE

Press **RECORD** again. "○" blinks and 0:30 appears on the front display panel.

3 SET RECORDING DURATION

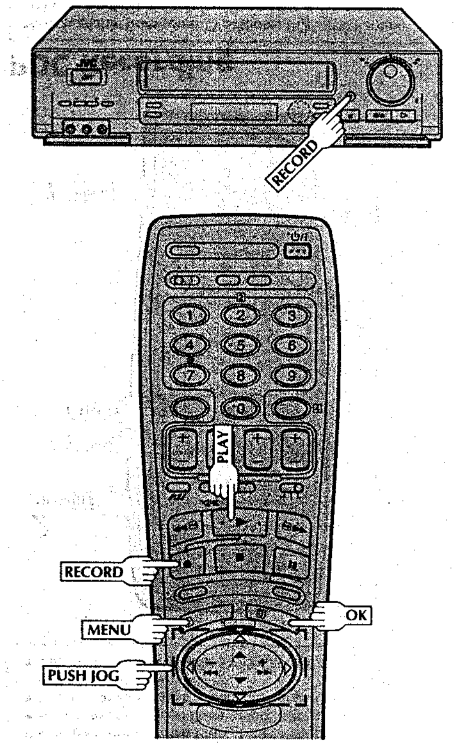
If you want to record for more than 30 minutes, press **RECORD** to extend the time. Each press extends recording time by 30 minutes.

NOTE:

*You can only perform ITR using the **RECORD** button on the recorder's front panel.*

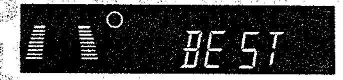
B.E.S.T. Picture System

Turn on the TV and select the VIDEO channel (or AV mode).

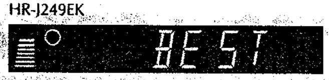


Display Panel Indication

HR-J745EK



HR-J249EK



As the tape check progresses, the "– –" marks on the display panel increase upward. Once the "BEST" indicator starts blinking, the check is complete.

The B.E.S.T. (Biconditional Equalised Signal Tracking) system checks the condition of the tape in use during recording and playback, and compensates to provide the highest-possible recording and playback pictures. The default setting for both recording and playback is "ON".

Recording

1 LOAD A CASSETTE

Insert a cassette with the record safety tab intact.

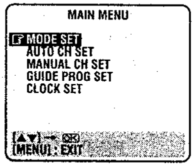
- The recorder power comes on automatically.

2 ACCESS MAIN MENU SCREEN

Press **MENU** twice.

3 ACCESS MODE SET SCREEN

Move the highlight bar (pointer) to "MODE SET" by pressing **PUSH JOG** △▽, then press **OK**.



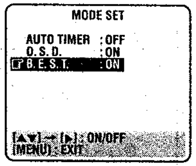
MAIN MENU

MODE SET
AUTO CH SET
MANUAL CH SET
GUIDE PROG SET
CLOCK SET

[▲▼] → OK
[MENU] : EXIT

4 CONFIRM B.E.S.T. STATUS

The default setting is "ON". If this is the case, go to step **4**. If not, press **PUSH JOG**▽ to move the highlight bar (pointer) to "B.E.S.T.", then press **PUSH JOG**▷ to set to "ON".



MODE SET

AUTO TIMER : OFF
O. S. D. : ON
B. E. S. T. : ON

[▲▼] → [▶] : ON/OFF
[MENU] : EXIT

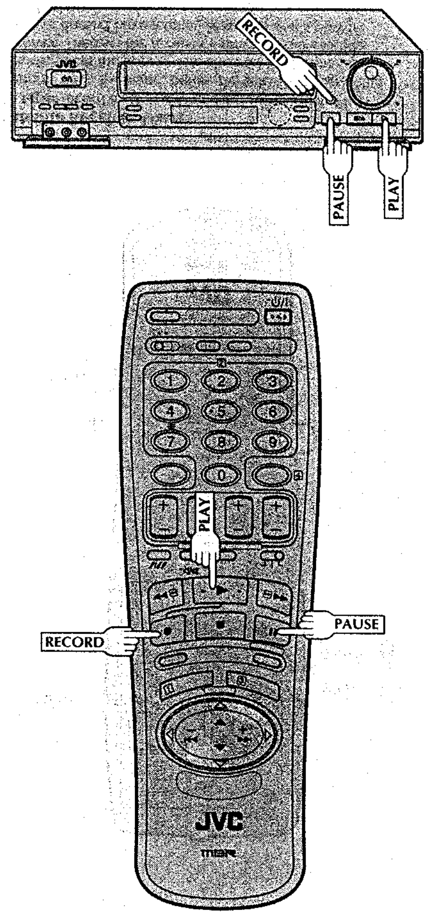
5 RETURN TO NORMAL SCREEN

Press **MENU**.

6 START RECORDING

Press and hold **RECORD** and **PLAY** on the remote, or **RECORD** on the recorder.

- The recorder spends approximately 7 seconds assessing the condition of the tape, then begins recording.
- When the "BEST" indicator begins blinking, that means adjustment is complete.
- Pressing the recorder's **RECORD** button while "BEST" is displayed does not start Instant Timer Recording (☞ pg. 19).



NOTES:

- *The B.E.S.T. system works for both SP and LP modes only after a tape has been inserted and the Record mode is first initiated. It does not work during recording.*
- *In the case of timer recording, the B.E.S.T. system works before recording is initiated.*
- *Once the cassette is ejected, the B.E.S.T. data is cancelled. The next time the cassette is used for recording, B.E.S.T. is re-performed.*

ATTENTION:

*Since the B.E.S.T. system works before recording actually starts, there is a delay of approximately 7 seconds after **RECORD** and **PLAY** on the remote are pressed, or **RECORD** on the recorder is pressed. To make sure you record the desired scene or programme in its entirety, first perform the following steps:*

*1) Press and hold **PAUSE** and **RECORD** to engage the RECORD PAUSE mode.*
  - *The recorder then automatically checks the condition of the tape and, after approximately 7 seconds, re-enters RECORD PAUSE.*

*2) Press **PLAY** to start recording.*
  - *If you want to bypass the B.E.S.T. system and begin recording immediately, set "B.E.S.T." to "OFF" in step **4** on page 20.*

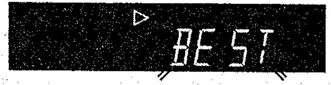
Playback

The recorder assesses the quality of the tape once you initiate playback. When watching a tape recorded with "B.E.S.T." set to "ON", it is recommended that you leave B.E.S.T. on during playback as well.

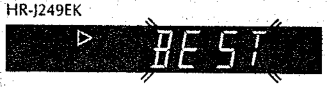
1 START PLAYBACK

Press **PLAY**.

HR-J745EK



HR-J249EK



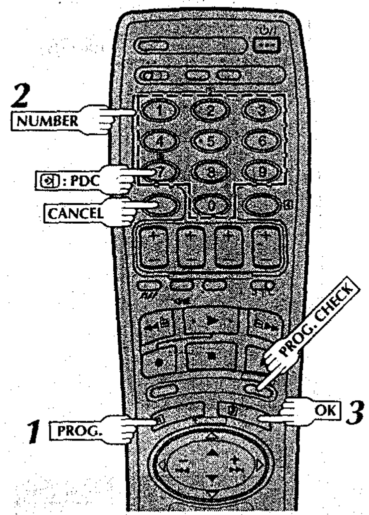
- The recorder adjusts the playback picture quality based on the quality of the tape in use.
- B.E.S.T. is active during Auto Tracking. "BEST" appears blinking on the recorder's display panel.

NOTES:

- *When watching a rental tape, or one recorded on another video recorder, set B.E.S.T. to your preference by performing steps **2** through **5** on page 20.*
- *"BEST" only appears at the beginning of automatic tracking. Even though it doesn't appear after that, the B.E.S.T. function is operative.*

Video Plus+ Timer Recording

Before performing Video Plus+ Timer Recording:
- Be sure to read "Video Plus+ Setup" (☞ pg. 10).
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



PDC Recording

Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over advertised times you preset in the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed.

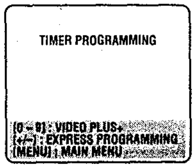
NOTES:

- *PDC Recording is also possible when a satellite receiver or a cable system is connected to AV2 IN on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector and the front panel connectors*.*

** With HR-J745EK only*

1 ACCESS TIMER PROGRAMMING SCREEN

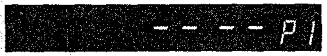
Press **PROG.**



TIMER PROGRAMMING

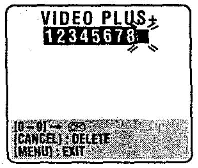
[0 – 9] : VIDEO PLUS+
[+/–] : EXPRESS PROGRAMMING
[MENU] : MAIN MENU

The front display panel looks like this:



2 ENTER PLUSCODE NUMBER

Press the **NUMBER** keys to enter the PlusCode number of a programme you wish to record.

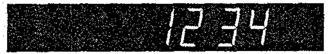


VIDEO PLUS+
12345678

[0 – 9] → OK
[CANCEL] : DELETE
[MENU] : EXIT

- If you make a mistake, press **CANCEL** to backspace and then input the correct number.

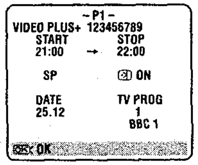
The PlusCode number you enter appears on the front display panel:



The display panel can show only a 4-digit number.

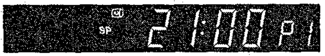
3 ACCESS VIDEO PLUS+ PROGRAM SCREEN

Press **OK**, and the Video Plus+ Program screen appears (if you're just starting out, "Program 1" appears).



– P1 –
VIDEO PLUS+ 123456789
START 21:00 → STOP 22:00
SP ⑧ ON
DATE 25.12
TV PROG 1 BBC 1
OK : OK

The display panel shows the programme start time. Pressing **PROG CHECK** changes the display to the programme stop time, then the date and preset position.

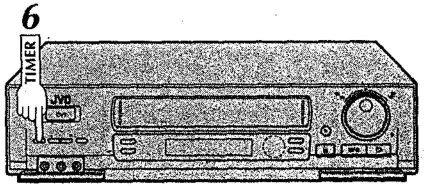


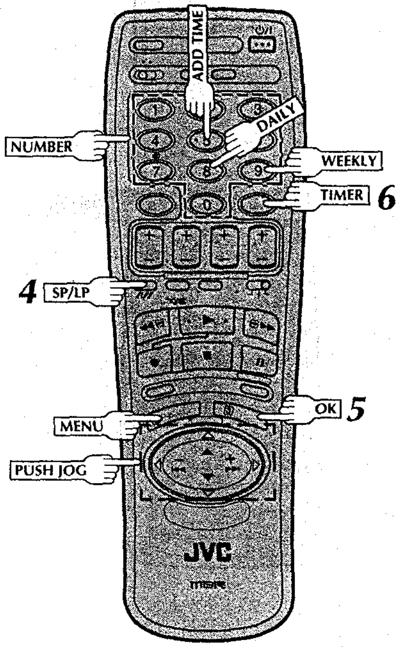
IMPORTANT

Be sure to confirm the setting of PDC recording.
- If " ⑧ ON" is displayed on the screen or " ⑧ " is lit on the display panel, PDC is set to ON.
- If " ⑧ OFF" is displayed on the screen or " ⑧ " is not lit on the display panel, PDC is set to OFF.

To change the setting, press ⑧ : **PDC** (**NUMBER** key "7").
☞ "PDC Recording" in the left column.

- Make sure the preset position number you wish to record is displayed; if not, see "Video Plus+ Setup" on page 10 and set the Guide Program number for that PlusCode number correctly.
- If the number you entered is invalid, "ERROR" appears on the screen and "Err" appears on the display panel. Press **CANCEL** to backspace and input a valid PlusCode number.
- If "ERROR=GUIDE PROG" appears on the screen, see "ATTENTION – Regarding Guide Program Number Set" on page 23.





Satellite Receiver Users

To timer-record a satellite broadcast using Video Plus+, perform steps 1 – 6 and, before the selected programme begins, select the appropriate channel on the satellite receiver. Then set the receiver's timer. If your satellite receiver doesn't have a timer, leave the unit's power switched on.

4 SET TAPE SPEED

Press **SP/LP** (▶///) to set the tape speed.

5 RETURN TO NORMAL SCREEN

Press **OK.**

- Repeat steps **1** – **5** for each additional programme.

6 ENGAGE RECORDER'S TIMER MODE

Press **TIMER**. The recorder turns off automatically.

NOTE:

To Delay The Stop Time . . .

. . . press **ADD TIME** after pressing **OK** in step **3**. Each time you press, the Stop time is delayed by 5 minutes (meaning that 5 minutes of recording time is added). You can easily compensate for anticipated programme schedule delays this way.

To Timer-Record Weekly Or Daily Serials . . .

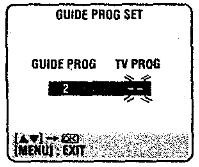
. . . after pressing **OK** in step **3**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 26).

ATTENTION

Regarding Guide Program Number Set

"ERROR=GUIDE PROG" appears after performing step **3** on the previous page if the Guide Program number for the PlusCode number you entered has not been set.
- If the recorder is in the stop or rewind or fast-forward mode, the following screen will appear with "– –" under "TV PROG" blinking.
  - Press the **NUMBER** keys or **PUSH JOG** △▽ to input the preset position number you recorder receives that station on, then press **OK**.



GUIDE PROG SET

GUIDE PROG 2
TV PROG – –

[▲▼] → OK
[MENU] : EXIT

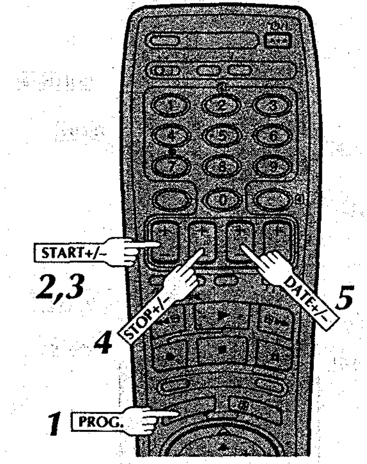
(Ex.) To timer-record a BBC2 programme with Video Plus+
* If your recorder receives BBC2 on the preset position 2, press **OK** after entering "2".

  - Press **MENU**, then try again from step **1**.
- If the recorder is in a mode other than the above mentioned modes, press **MENU** first and input the correct Guide Program number for that PlusCode number (☞ pg. 10, "Video Plus+ Setup"), then try again from step **1**.

Regular Timer Programming

Remember, the clock must be set before you can progamme the timer (☞ pg. 46).

Before performing the following steps:
- Insert a cassette with the safety tab in place. The recorder will come on automatically.
- Turn on the TV and select the VIDEO channel (or AV mode).



PDC Recording

Now available from some TV stations, PDC (Programme Delivery Control) is a service designed to assure safe, accurate timer recording. With this system, special code signals are transmitted together with the audio/video signals. These code signals control your video recorder and have precedence over advertised times you preset in the timer. This means that your recorder will start and stop recording when the preset TV programmes actually start and end — even if the broadcast time of a preset TV programme is changed.

NOTES:

- *Set the start time (PDC time) exactly as advertised in the TV listing. A different time than advertised will result in no recording.*
- *PDC Recording is also possible when a satellite receiver or a cable system is connected to AV2 IN on your recorder.*
- *PDC recording is also possible via the AV1 IN/OUT connector and the front panel connectors*.*
  ** With HR-J745EK only*

If you don't know the PlusCode number for the programme you wish to record, use the following procedure to set your recorder to timer-record the programme.

1

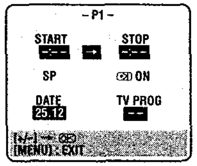
ACCESS TIMER PROGRAMMING SCREEN

Press **PROG.**

2

ACCESS PROGRAMME SCREEN

Press **START +/–**. (If you're just starting out, "Program 1" appears.)



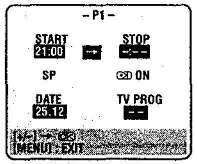
The front display panel looks like this:

3

ENTER PROGRAMME START TIME

Press **START +/–** to enter the time you want recording to start.

- Press and hold **START +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



The front display panel looks like this:

4

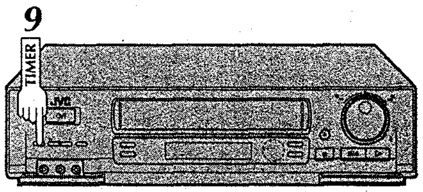
ENTER PROGRAMME STOP TIME

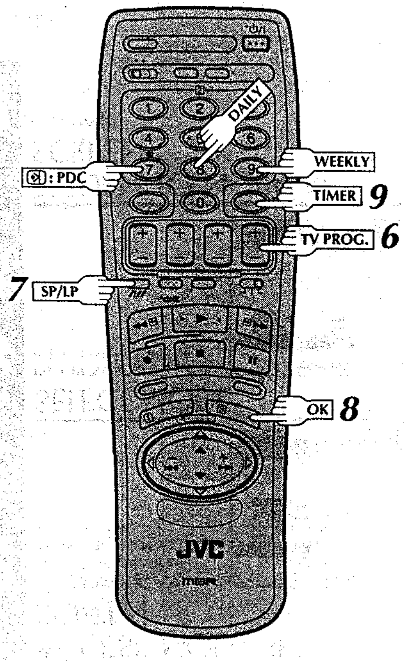
Press **STOP +/–** to enter the time you want recording to stop.

5

ENTER PROGRAMME DATE

Press **DATE +/–**. (The current date appears on screen. The date you enter appears in its place.)

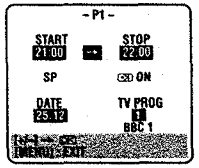




6

ENTER PRESET POSITION

Press **TV PROG. +/–**.



IMPORTANT
Be sure to confirm the setting of PDC recording.
- If " ON" is displayed on the screen or " " is lit on the display panel, PDC is set to ON.
- If " OFF" is displayed on the screen or " " is not lit on the display panel, PDC is set to OFF.

To change the setting, press : **PDC** (**NUMBER** key "7").
☞ "PDC Recording" on page 24.

7

SET TAPE SPEED

Press **SP/LP** (**////**) to set the tape speed.

8

RETURN TO NORMAL SCREEN

After confirming all information is correct, press **OK** and the normal screen appears.

- Repeat steps **1** – **8** for each additional programme.

9

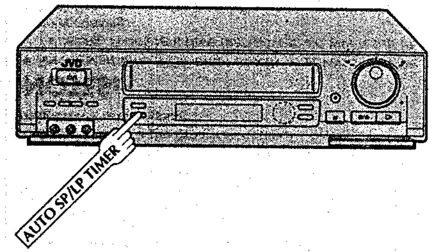
ENGAGE RECORDER'S TIMER MODE

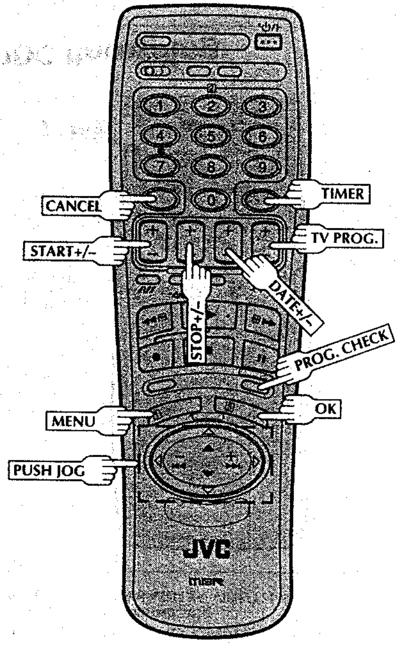
Press **TIMER**. The recorder turns off automatically.

To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps 2 through **8**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday – Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

NOTES:

- *You can programme this recorder to timer-record as many as 8 programmes. If you try to programme the recorder to record a ninth, "PROGRAM FULL" appears on screen and "FULL" appears on the front display panel. To record the extra programme, you must first cancel any unnecessary programmes (☞ pg. 26).*
- *To timer-record a satellite broadcast through a satellite receiver connected to the AV2 IN connector on the back of the recorder, in step **6** above, set "TV PROG" to "AUX2" by pressing **TV PROG. +/–**. Before the selected programme begins, select the appropriate channel on the satellite receiver, then set the receiver's timer. If your satellite receiver doesn't have a timer, leave the unit's power switched on.*





Check And Cancel Programmes

1 ACCESS PROGRAMME SCREEN

Press **PROG. CHECK.**

- The display panel shows the programme start time. Pressing **OK** changes the display to the programme stop time, then the date and preset position.
- If the recorder is turned on and the TV is set to its VIDEO channel or AV mode, you can check program information on screen as well.
- Each time you press **PROG. CHECK**, the next programme's information appears.

If All Information Is Correct . . .

. . . programming is completed.

If You Wish To Revise Data . . .

. . . with the recorder's power turned on, go to step **2**.

If You Wish To Cancel A Program . . .

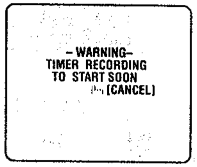
. . . with the recorder's power turned on, press **CANCEL.** All information you input is deleted.

2 REVISE PROGRAMME INFORMATION

Input the appropriate data using the **START +/–, STOP +/–, DATE +/–** and **TV PROG. +/–** buttons on the remote control.

Timer Warning

If you have programmed your recorder to timer-record a programme or a series of programmes, a warning appears on screen to tell you that the recording is to start in 5 minutes.


– WARNING–
TIMER RECORDING
TO START SOON
[CANCEL]

NOTES:

- *The warning only appears if you're not in the Timer mode at that time.*
- *If this recorder is being used as the player for tape dubbing, the warning screen is recorded on the tape in the other video recorder.*

The warning blinks for the entire 5 minutes leading up to the start of timer recording. To clear the display, press **CANCEL.**

Auto Timer

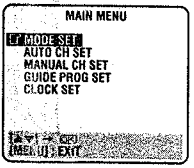
When the Auto Timer is set to ON the timer is automatically engaged when the recorder power is turned off and automatically disengaged when the recorder is powered back on.

1 ACCESS MAIN MENU SCREEN

Press **MENU** twice.

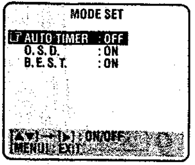
2 ACCESS MODE SET SCREEN

Press **PUSH JOG** △▽ to move the highlight bar (pointer) to "MODE SET", then press **OK.**



3 SELECT MODE

Press **PUSH JOG** ▷to select either "ON" or "OFF".


AUTO TIMER : OFF
O.S.D. : ON
B.E.S.T. : ON

4 RETURN TO NORMAL SCREEN

Press **MENU.**

NOTE:

*For safety, when Auto timer is set to "OFF", all other recorder functions are disabled while the Timer mode is engaged. To disengage the timer, press **TIMER**.*

Auto SP/LP Timer

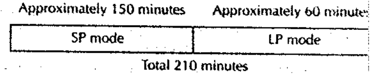
If, when recording in SP mode, there is not enough tape to record the entire programme, the recorder automatically switches to LP mode to allow complete recording.

1 ENGAGE AUTO SP/LP TIMER

Press **AUTO SP/LP TIMER** on the recorder front pane
The button lights up.

For Example . . .

Recording a program of 210 minutes in length onto
180-minute tape

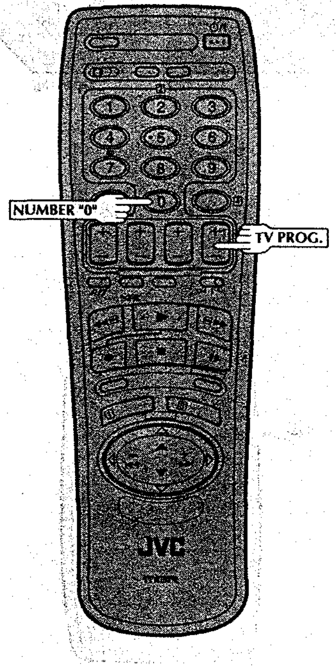


Make sure you press **AUTO SP/LP TIMER** before performing timer programming.

NOTES:

- *The Auto SP/LP Timer feature is not available during ITR (Instant Timer Recording), and the feature will not work properly with any tapes longer than E-180 as well as some tapes of shorter lengths.*
- *Even if, in step **1**, you press **AUTO SP/LP TIMER** and the button lights up, that doesn't mean that the recorder will automatically change from SP to LP mode during the cours of the recording. Watch the tape later to confirm.*
- *If you have programmed the recorder to timer-record 2 or more programs, the second programme and those thereafte may not fit on the tape if you engage the Auto SP/LP Timer mode. In this case, make sure the mode is not engaged, th set the tape speed manually during timer programming.*
- *There may be some noise at the point on the tape where th recorder switches from SP to LP mode.*
- *If you perform timer recording with both PDC and the Aut SP/LP Timer activated, and the programme goes beyond its originally scheduled length, there may be times when the programme cannot be recorded in its entirety.*

Edit To Or From Another Video Recorder


NUMBER "0"
TV PROG.
JVC

You can use your video recorder as the source player or the recording deck.

1 MAKE CONNECTIONS

Connect the player's 21-pin SCART connector to the recorder's 21-pin SCART connector as illustrated on page 29.

When Using Your Video Recorder As The Source Player . . .
. . . connect its AV1 IN/OUT connector to the recording deck.

When Using Your Video Recorder As The Recording Deck . . .
. . . connect its AV2 IN or AV1 IN/OUT connector to the source player.

2 SET RECORDING DECK'S INPUT MODE

Set to AUX. With this video recorder, press **NUMBER** key "0" and/or **TV PROG.** to select depending on the connector being used — "AU-1" for the AV1 IN/OUT connector, or "AU-2" for the AV2 IN connector.

3 START SOURCE PLAYER

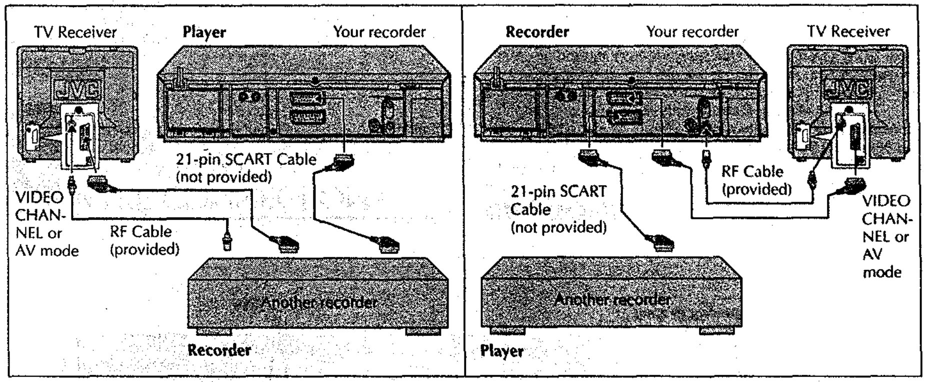
Engage its Play mode.

4 START RECORDING DECK

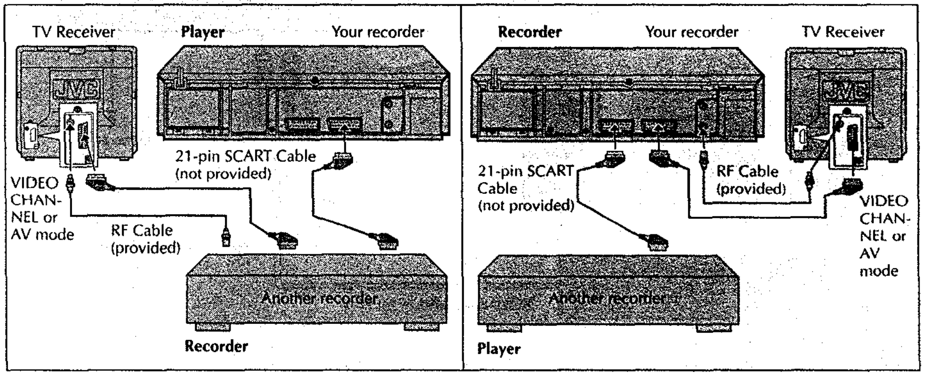
Engage its Record mode.

NOTE:
All necessary cables can be obtained from your dealer.

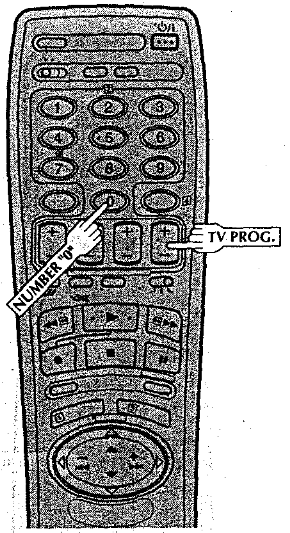
HR-J745EK

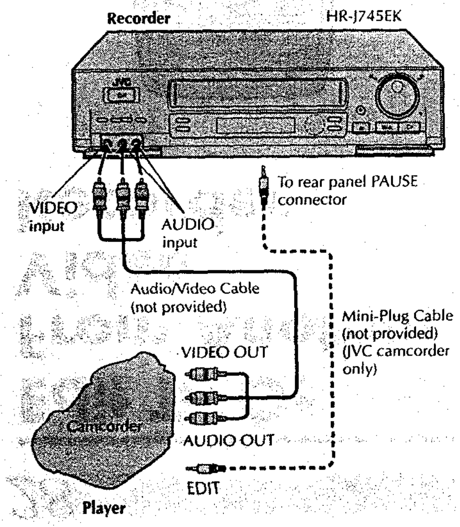

TV Receiver
Player
Your recorder
21-pin SCART Cable (not provided)
VIDEO CHAN-NEL or AV mode
RF Cable (provided)
Another recorder
Recorder
Recorder
Your recorder
TV Receiver
21-pin SCART Cable (not provided)
RF Cable (provided)
VIDEO CHAN-NEL or AV mode
Another recorder
Player

HR-J249EK


TV Receiver
Player
Your recorder
21-pin SCART Cable (not provided)
VIDEO CHAN-NEL or AV mode
RF Cable (provided)
Another recorder
Recorder
Recorder
Your recorder
TV Receiver
21-pin SCART Cable (not provided)
RF Cable (provided)
VIDEO CHAN-NEL or AV mode
Another recorder
Player

Edit From A Camcorder


NUMBER "0"
TV PROG.


Recorder
HR-J745EK
VIDEO input
AUDIO input
To rear panel PAUSE connector
Audio/Video Cable (not provided)
Mini-Plug Cable (not provided) (JVC camcorder only)
VIDEO OUT
AUDIO OUT
EDIT
Camcorder
Player

You can use a camcorder as the source player and your video recorder as the recorder.

1 MAKE CONNECTIONS

For HR-J745EK owners...
Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's front panel AUDIO/VIDEO input connectors.

- When using a monaural camcorder, connect its AUDIO OUT connector to the AUDIO L input connector on your recorder.
- When a Master Edit Control-equipped JVC camcorder is used, the camcorder is capable of controlling the recorder. Refer to the camcorder's instruction manual for operating procedure.

For HR-J249EK owners...
Connect the camcorder's AUDIO/VIDEO OUT connectors to the recorder's rear panel AV2 IN or AV1 IN/OUT connectors via the optional cable adapter.

- When using a Hi-Fi camcorder, connect its AUDIO OUT L connector to the recorder's rear panel AV2 IN or AV1 IN/OUT connectors via the optional cable adapter.

2 SET RECORDER'S INPUT MODE

For HR-J745EK owners...
Press **NUMBER** key "0" and/or **TV PROG.** so that "F-AU" appears in place of a preset position number.

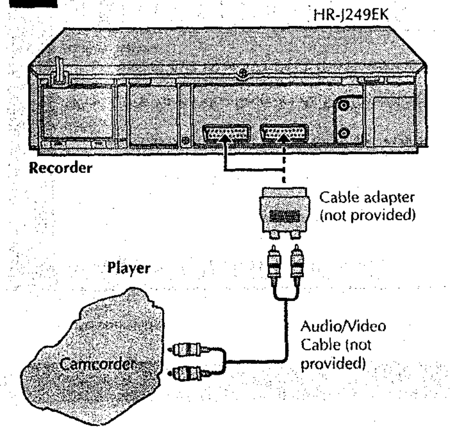
For HR-J249EK owners...
Press the **NUMBER** key "0" and/or **TV PROG.** to select the appropriate input mode depending on the connector being used; "AU-1" for the AV1 IN/OUT connector, or "AU-2" for the AV2 IN connector.

3 START CAMCORDER

Engage its Play mode.

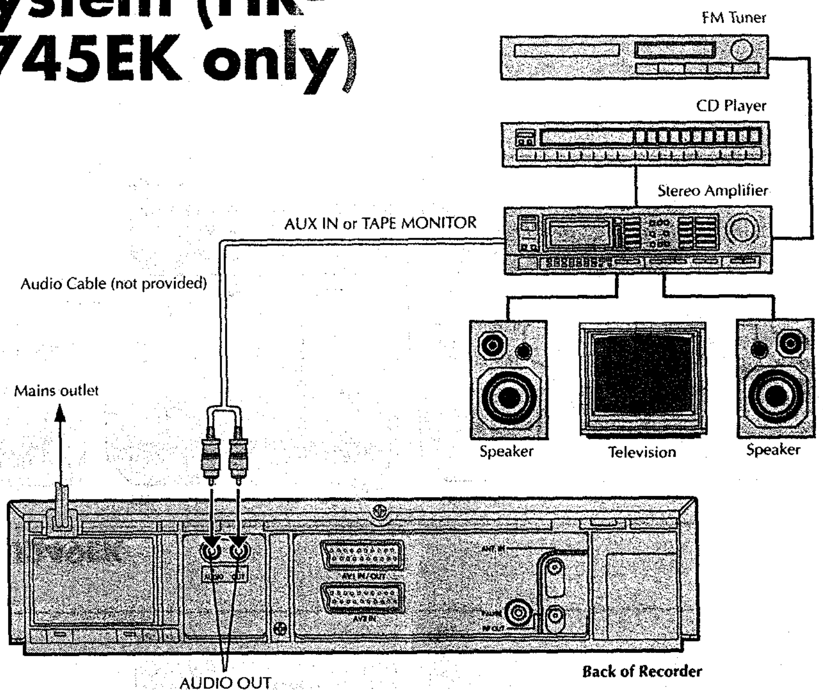
4 START RECORDER

Engage its Record mode.


HR-J249EK
Recorder
Cable adapter (not provided)
Player
Camcorder
Audio/Video Cable (not provided)

Connection To A Stereo System (HR-J745EK only)

These instructions enable you to connect your video recorder to your Hi-Fi stereo system (if you have one) and listen to the soundtrack through the stereo.


FM Tuner
CD Player
Stereo Amplifier
AUX IN or TAPE MONITOR
Audio Cable (not provided)
Mains outlet
Speaker
Television
Speaker
AUDIO OUT
Back of Recorder

1 MAKE CONNECTIONS

Connect the AUDIO OUT L and R connectors on your video recorder to the AUX IN or TAPE MONITOR terminals on your stereo system's receiver or amplifier.

NOTES:

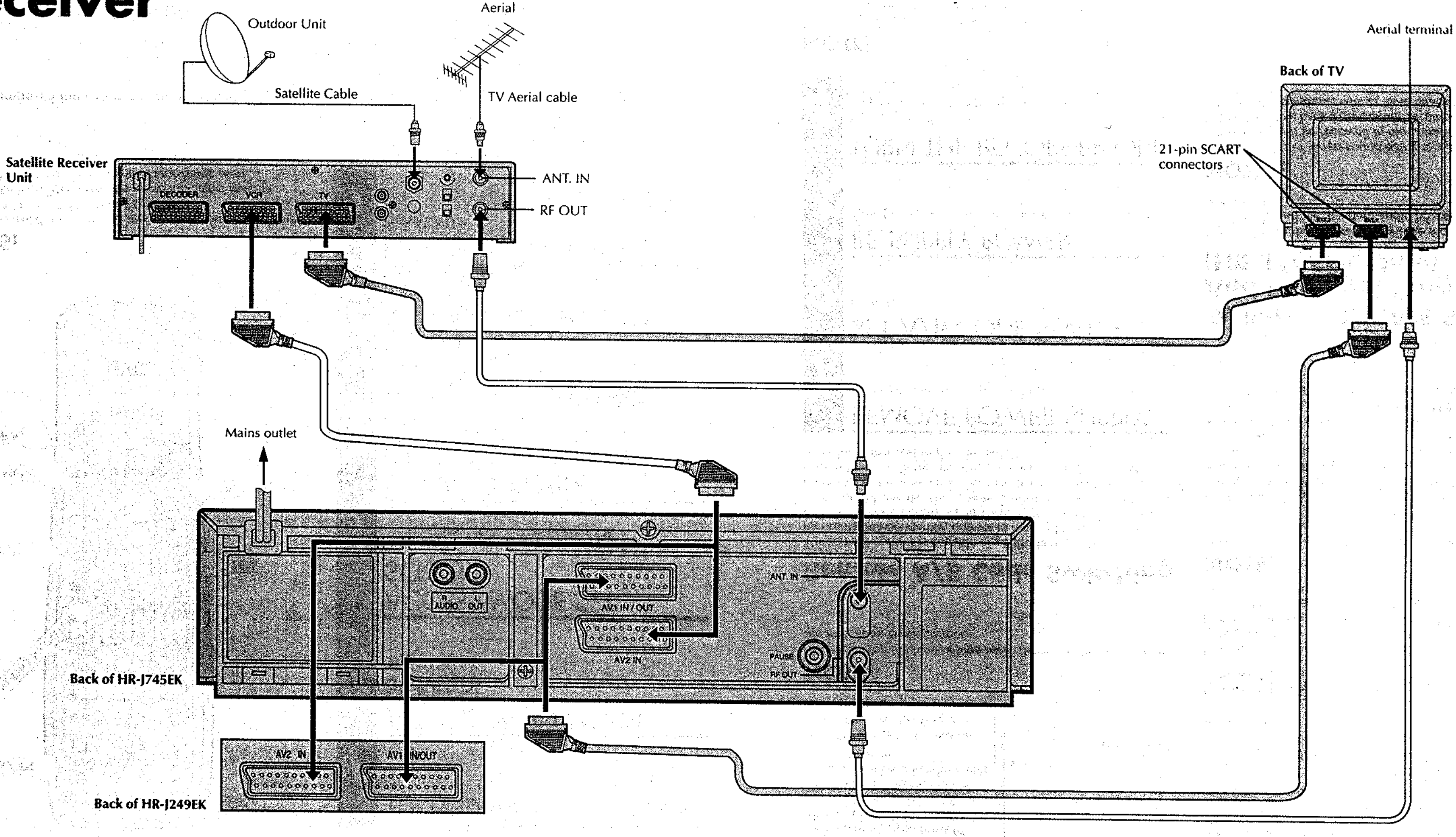
- *When connecting your recorder's audio output connectors to a stereo amplifier, make sure you connect L and R correctly.*
- *If NICAM TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected stereo system.*
- *When listening to sound through the connected stereo system, turn the TV's volume down completely.*

CAUTIONS:

- This recorder has a dynamic range of more than 80 dB with regards to its Hi-Fi audio capability. It is recommended that you check the maximum level if you are going to listen to the Hi-Fi audio signals through a stereo amplifier. A sudden surge in the input level to the speakers may damage them.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set as this can adversely affect the video playback picture.

Connection To A Satellite Receiver

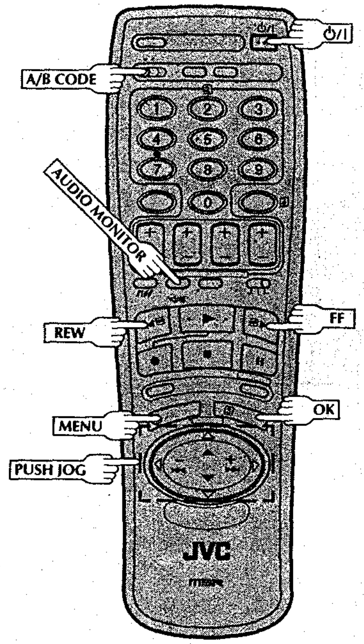
The AV2 IN socket on the rear panel of your recorder allows simple connection to a satellite receiver.


Outdoor Unit
Aerial
Satellite Cable
TV Aerial cable
Satellite Receiver Unit
DECODER
VCR
TV
ANT. IN
RF OUT
Mains outlet
AUDIO OUT
AV1 IN / OUT
AV2 IN
ANT. IN
PAUSE
RF OUT
Back of HR-J745EK
AV2 IN
AV1 IN/OUT
Back of HR-J249EK
Aerial terminal
Back of TV
21-pin SCART connectors

NOTES:

- *When connecting your recorder to a TV equipped with 21-pin SCART connectors, follow the illustration above using the cables shown in gray.*
- *For details, check your satellite receiver's instruction manual.*

Turn on the TV and select the VIDEO channel (or AV mode).



NOTES:

- *When you use this recorder as the player for editing, be sure to set "O.S.D." to "OFF." before starting.*
- *During playback, the operation mode indicators may be disturbed depending on the type of tape being used.*

On-Screen Display

You can choose whether or not to have various operational indicators appear on screen, by setting this function ON or OFF.

1 TURN ON THE RECORDER

Press ⏻/I.

2 ACCESS MAIN MENU SCREEN

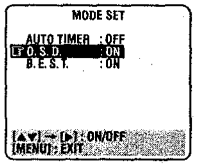
Press **MENU** twice.

3 ACCESS MODE SET SCREEN

Move the highlight bar (pointer) to "MODE SET" by pressing **PUSH JOG** △▽, then press **OK**.

4 ENABLE/DISABLE ON-SCREEN DISPLAY

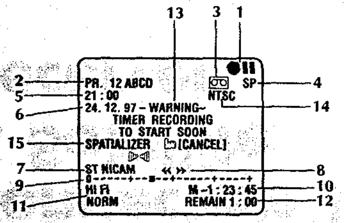
The default setting is "ON", so if you want on-screen displays, leave the setting as it is and go to step 5. If you don't want the displays to appear, press **PUSH JOG** △▽ to move the highlight bar (pointer) to "O.S.D." and press **PUSH JOG** ▷ to set "O.S.D." to "OFF".


```
MODE SET

  AUTO TIMER  : OFF
☞ O.S.D.      : ON
  B.E.S.T.    : ON

[▲▼] → [▶] : ON/OFF
[MENU] : EXIT
```

5 RETURN TO NORMAL

Press **MENU**.

The superimposed indication on the TV screen tells you what the recorder is doing.

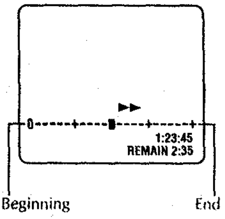


1– Operation mode indicators
2– Preset position number and station name/Aux. indicator (AUX1, AUX2 or F-AUX*)
  * *"F-AUX" is available with HR-J745EK only.*
3– Cassette loaded mark
4– Tape speed SP/LP/EP (EP is for NTSC playback only)
5– Clock display
6– Current day/month/year
7– NICAM display (☞ pg. 35)(HR-J745EK only)
8– Tape direction
9– Tape position indicator (☞ pg. 35)
10– Counter display (including Counter Memory indicator)
11– Audio mode display (☞ pg. 16)(HR-J745EK only)
12– Tape remaining time indicator (☞ pg. 19)
13– Timer warning display (☞ pg. 26)
14– NTSC display (☞ pg. 17)
15– Spatializer indicator (☞ pg. 16)(HR-J745EK only)

Tape Position Indicator

The tape position indicator appears on screen when, from the Stop mode, you press **FF**, **REW** or perform an Index Search. The position of "■" in relation to "0" (beginning) or "+" (end) shows you where you are on the tape.

"O.S.D." (☞ pg. 34) must be set to "ON", or the indicator will not appear.



NOTE:

Depending on the type of tape used, there may be times when the indication is not correct.

Remote A/B Code Switching

The remote control is capable of controlling two JVC video recorders independently; one set to respond to the remote control's A code control signals and another set to respond to B code control signals. The remote control is preset to send A code signals because your video recorder is initially set to respond to A code signals. You can easily modify your video recorder to respond to B code signals.

1 REMOVE POWER SUPPLY

Unplug the mains power cord from the mains outlet.

2 SET A/B CODE SWITCH

Set to B.

3 RE-SUPPLY POWER

Plug the mains power cord back into the mains outlet.

4 TURN THE RECORDER ON

Press ⏻/I on the remote control. The recorder will now only respond to B code signals.

NOTE:

Some TV sets may malfunction in response to the B mode. If this happens, switch back to the A mode.

Receiving NICAM Stereo And Bilingual Programmes (HR-J745EK Only)

Your recorder is equipped with a Digital stereo sound decoder (NICAM), making reception of stereo and bilingual broadcasts possible.

When the recorder is tuned to a different station, the type of broadcast being received will be displayed on the TV screen for a few seconds.

Type of Broadcast Being Received	On-screen Display
Regular Monaural	(none)
NICAM Stereo	ST NICAM
NICAM Bilingual	BIL NICAM
NICAM Monaural	NICAM

NOTE:

"O.S.D." must be set to "ON" or the on-screen displays will not appear (☞ pg. 34).

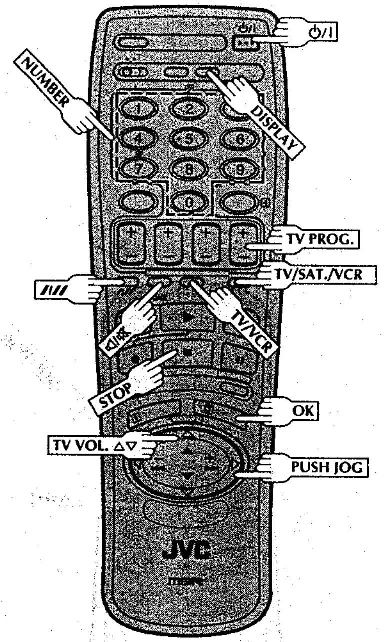
- To listen to a stereo programme, press **AUDIO MONITOR** until "L" and "R" appear on the front display panel.
- To listen to a bilingual programme, press **AUDIO MONITOR** until either "L" or "R" appears on the front display panel (as required).
- To listen to the Standard (regular monaural) audio while receiving a NICAM broadcast, press **AUDIO MONITOR** until "NORM" appears on the front display panel.

To Record NICAM Stereo And Bilingual Programmes (HR-J745EK Only)

The NICAM audio programme will be recorded on the Hi-Fi audio track, and the Standard audio programme on the normal audio track.

NOTES:

- *If the quality of stereo sound being received is poor, the broadcast will be received in monaural with better quality.*
- *Before playing back a programme recorded in stereo, or a bilingual programme, refer to "Soundtrack Selection" (☞ pg. 16).*



Control Your TV Using Additional Buttons

The **NUMBER** keys on the remote can also be used to select the TV's channel by setting the remote control to the TV mode.

1. Set the **TV/SAT./VCR** switch to TV.
2. Use the **NUMBER** keys, and the **////** **(Digit Entry)** button, the **PUSH JOG** button, the **DISPLAY** button or the **OK** button to select the TV's channel.

- With televisions under Code 01, 02, 03, 04, 06, 07, 09, 10, 13, 14 or 22, the **////** button corresponds to the 1-digit/2-digit entry switching button (often labelled – /– –) of your TV's remote control.
- With televisions under Code 01, 11 or 12, the **PUSH JOG** ◁ button corresponds to the 10 + button, and the **PUSH JOG** ▷ button corresponds to the 20 + button of your TV's remote control.
- With televisions using Code 12, the **DISPLAY** button corresponds to the 30 + button.
- With televisions using Code 09, the **OK** button corresponds to the ENTER button of your TV's remote control.

NOTES:

The way these buttons are used is determined by your TV. Use these buttons as instructed for your TV's remote control.

TV Multi-brand Remote Control

Your remote control can operate the basic functions of your TV set. In addition to JVC TVs, other manufacturer's TVs can also be controlled by setting the appropriate switch on the remote control.

Before you start . . .

- Turn on the TV using its remote control.
- Set the remote control's **TV/SAT./VCR** switch to TV.

1

SET TV BRAND CODE

Refer to the chart below. While holding down ⏻/I, enter your TV's brand code using the **NUMBER** keys, then press **STOP**.

- JVC has four codes. If the TV does not function with one code, try entering another.
- You don't have to repeat this step until you replace your remote control's batteries.

2

TRY OPERATING TV

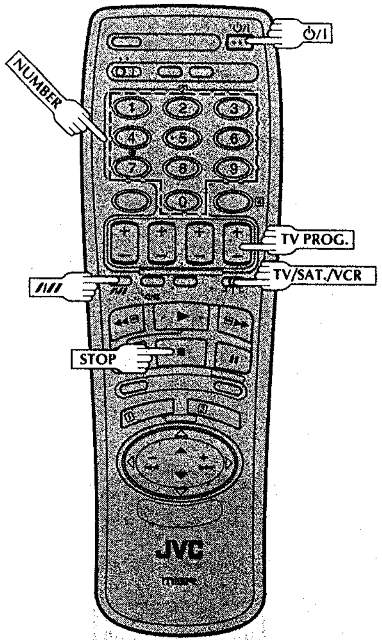
Press ⏻/I on the remote to turn the TV off. If it goes off, try other operations.

- The ⏻/I button, **TV/VCR** button, **TV PROG. +/–** button, **TV VOL.** △▽ button and ◁/🔇 **(Mute)** button on the remote can all be used to operate the TV.
- To return the remote to video recorder control, set its **TV/SAT./VCR** switch to VCR.

IMPORTANT

Although the provided remote control unit is compatible with JVC televisions, as well as many other models, it may not work with your TV, or in some instances, may have limited function capability.

TV BRAND NAME	CODE
JVC	01, 02, 03, 04
BRANDT	05
NORDMENDE	05
SABA	05
TELEAVIA	05
TELEFUNKEN	05
THOMSON	05
FERGUSON	06
PHILIPS	07
BLAUPUNKT	08
GRUNDIG	08
SONY	09
PANASONIC	10
GRAETZ	11
ITT	11
LUXOR	11
SALORA	11
SELECO	11
MIVAR	12
HITACHI	13
TOSHIBA	14
MITSUBISHI	15
FINLUX	16
NOKIA	17
SHARP	18
FUNAI	20
NEC	22



Satellite Receiver Multi-Brand Remote Control

Your remote control can operate the basic functions of your satellite receiver set. In addition to JVC satellite receivers, other manufacturer's satellite receivers can also be controlled by setting the appropriate switch on the remote control.

Before you start . . .

- Turn on the satellite receiver using its remote control.
- Set the remote control's **TV/SAT./VCR** switch to SAT.

1

SET SATELLITE RECEIVER BRAND CODE

Refer to the chart below. While holding down ⏻/I, enter your satellite receiver's brand code using the **NUMBER** keys, then press **STOP**.

- Some satellite receiver brands have more than one code. If the satellite receiver does not function with one code, try entering another.
- You don't have to repeat this step until you replace your remote control's batteries.

2

TRY OPERATING SATELLITE RECEIVER

Press ⏻/I on the remote to turn the satellite receiver off. If it goes off, try other operations.

- The ⏻/I button, **TV PROG. +/–** button, **NUMBER** buttons on the remote can all be used to operate the satellite receiver.
- The **NUMBER** buttons will not work with JVC satellite receivers using code 13.
- With satellite receivers using Code 16, the **////** button corresponds to the ENTER button of your satellite receiver's remote control.
- To return the remote to video recorder control, set its **TV/SAT./VCR** switch to VCR.

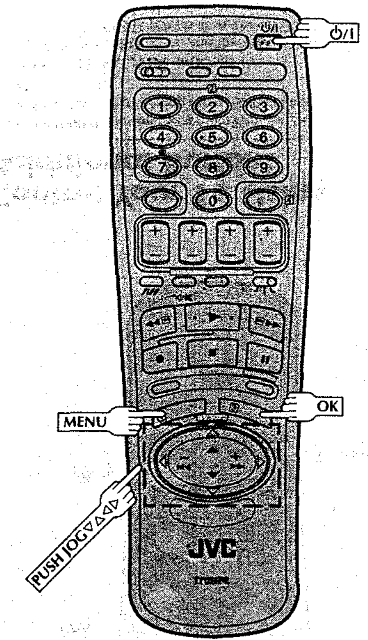
IMPORTANT

Although the provided remote control unit is compatible with JVC satellite receivers, as well as many other models, it may not work with your satellite receiver, or in some instances, may have limited function capability.

SATELLITE RECEIVER BRAND	CODE
JVC	13, 14
AMSTRAD	01, 02, 03, 04
SIEMENS	05
GRUNDIG	05, 06
KATHREIN	05, 11, 12
PACE	06, 08
PHILIPS	07
ITT	09
NOKIA	09
SKYMASTER	10
RFT	10
MASPRO	11
BT	13
PANASONIC	15
JERROLD	16

Auto Channel Set

Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT
Perform the following steps only if auto channel set has not been set correctly by Auto Set Up function (☞ pg. 8) or if you have moved to a different area or if a new station starts broadcasting in your area.

Your recorder needs to memorise all necessary stations in preset positions in order to record TV programmes. Auto Channel Set automatically assigns all receivable stations in your area.

1 TURN ON THE RECORDER

Press ⏻/I.

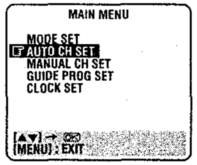
2 ACCESS MAIN MENU SCREEN

Press **MENU** twice.

3 PERFORM AUTO CHANNEL SET

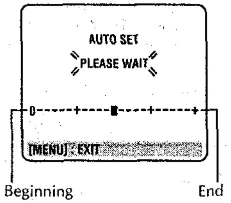
Move the highlight bar (pointer) to "AUTO CH SET" by pressing **PUSH JOG** △▽, then press **OK**.

- The Auto Set screen appears, and remains on screen while the recorder searches for receivable stations. As Auto Channel Set progresses, the " ▮ " mark on the screen moves from left to right. Wait until the screen as shown in step 4 appears.

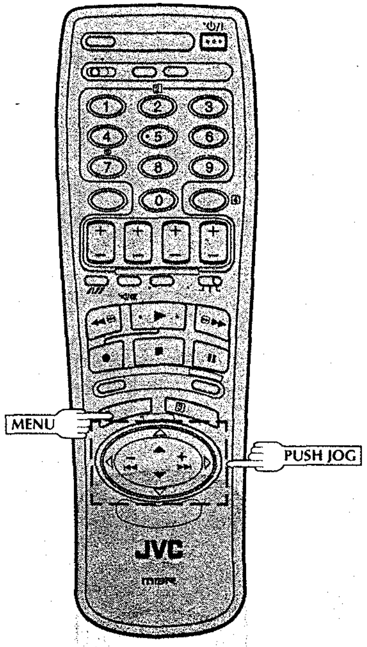

MAIN MENU

MODE SET
☞ AUTO CH SET
MANUAL CH SET
GUIDE PROG SET
CLOCK SET

[▲▼] → OK
[MENU] : EXIT

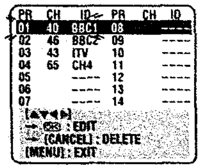

AUTO SET
PLEASE WAIT

[MENU] : EXIT



4 VIEW CONFIRMATION SCREEN

The stations your recorder located appear on a Confirmation screen — preset positions (PR), channels (CH) and station names (ID – ☞ pg. 44). To view the next page of the listing, press **PUSH JOG** △▽◁▷. The blueback screen and the program currently being broadcast by the blinking station appear alternately for 5 seconds each.



PR	CH	ID	PR	CH	ID
01	40	BBC1	08		----
02	46	BBC2	09		----
03	43	ITV	10		----
04	65	CH4	11		----
05		----	12		----
06		----	13		----
07		----	14		----

[▲▼◀▶]
→ OK : EDIT
→ [CANCEL] : DELETE
[MENU] : EXIT

- The Guide Program numbers will also be set automatically during Auto channel Set.

5 RETURN TO NORMAL SCREEN

Press **MENU**. .

- Using the Confirmation screen, you can skip or add preset positions, enter station names and perform other operations. Refer to pages 40 – 43 for the procedures.
- Depending on reception conditions, the stations may not be stored in order, and the station names may not be stored correctly.

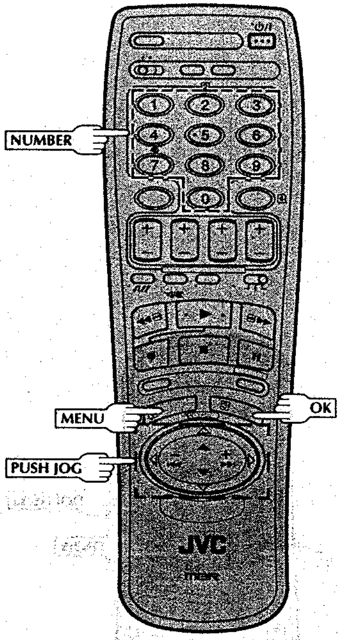
IMPORTANT

- Depending on the reception conditions, the station names may not be stored correctly, and auto Guide Program Number Set may not work properly. If the Guide Program numbers are not set properly, Video Plus+ timer recording (☞ pg. 22) will not work correctly; be sure to check if the Guide Program numbers have been set correctly (☞ pg.10, "Video Plus+ Setup").
- Since your video recorder memorizes all detected stations even if the reception condition is poor, some of those stored stations may produce a noisy picture. To delete those stations, ☞ "Delete A Channel" on page 41.

NOTE:

Fine tuning is performed automatically during Auto Channel Set. If you want to perform it manually, refer to page 43.

Manual Channel Set



Storing Channels Manually

Store channels that were not stored during Auto Set Up (☞ pg. 8) or Auto Channel Set (☞ pg. 38).

1 ACCESS MAIN MENU

Press **MENU** twice.

2 ACCESS CONFIRMATION SCREEN

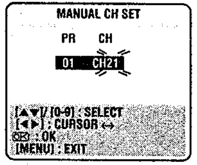
Press **PUSH JOG**△▽ to move the highlight bar (pointer) to "MANUAL CH SET", then press **OK**. The Confirmation screen appears.

3 SELECT POSITION

Press **PUSH JOG**△▽◁▷ until an open position in which you want to store a channel begins blinking, then press **OK**. The Manual Ch. Set screen appears.

4 INPUT CHANNEL

The number "21" appears blinking to the right of "CH". Press the **NUMBER** keys to input the channel number you want to store.


MANUAL CH SET

PR CH

01 CH21

[▲▼]/ [0-9] : SELECT
[◀▶] : CURSOR ↔
OK : OK
[MENU] : EXIT

- For fine tuning adjustment, press **PUSH JOG**▷ until the channel number begins blinking, then press **PUSH JOG**△▽. While tuning, "F+" or "F–" appears.

5 ENTER NEW CHANNEL INFORMATION

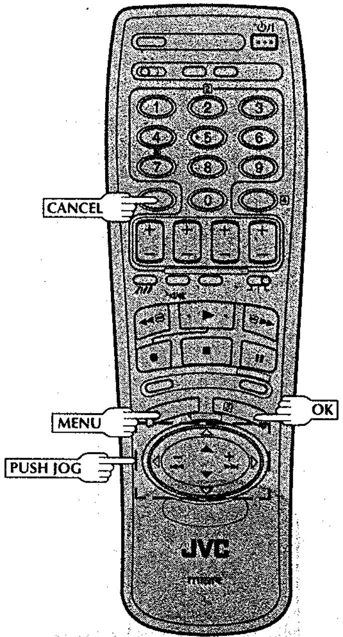
Press **OK** and the Confirmation screen appears.

- Repeat steps **3** through **5** as necessary.

6 CLOSE CONFIRMATION SCREEN

Press **MENU**.

- To input the station name, see page 42.
- To change positions, see "Change Station Preset Position" (☞ pg. 41).



Perform steps **1** and **2** of "Storing Channels Manually" on page 40 to access the Confirmation screen before continuing.

Delete A Channel

1 SELECT ITEM

Press **PUSH JOG**△▽◁▷ until the item you want to delete begins blinking.

2 DELETE CHANNEL

Press **CANCEL**.

- The item directly beneath the cancelled one moves up one line.
- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Change Station Preset Position

1 SELECT ITEM

Press **PUSH JOG**△▽◁▷ until the item you want to move begins blinking. Then press **OK** and the station name (ID) and its channel (CH) number begin blinking.

2 SELECT NEW POSITION

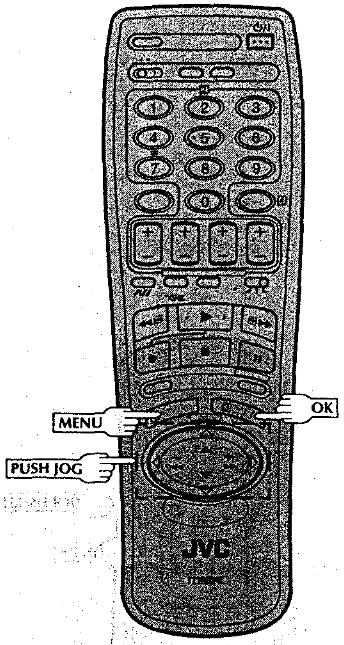
Press **PUSH JOG**△▽◁▷ to move the station to the new preset position, then press **OK**.

Example: If you moved the station in position 3 to position 7, the stations originally in positions 4–7 each move up one space.

- Repeat steps **1** and **2** as necessary.

3 CLOSE CONFIRMATION SCREEN

Press **MENU**.



Perform steps **1** and **2** of "Storing Channels Manually" on page 40 to access the Confirmation screen before continuing.

Set Stations (A)

1 SELECT ITEM

Press **PUSH JOG**△▽◁▷ until the item you want begins blinking. Then press **OK** twice and the station's name (ID) begins blinking.

2 SELECT NEW STATION

Press **PUSH JOG**△▽ until the new station's name (ID) you want to store begins blinking.
Registered station names (☞ pg. 44) appear as you press **PUSH JOG**△▽.

3 SWITCH STATIONS

Press **OK**.

- Repeat steps **1** through **3** as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **MENU**.

Set Stations (B)

NOTE:

First perform step 1 of the above procedure.

2 SELECT STATION NAME CHARACTER

Press **PUSH JOG** ▷ and the first letter of the station name begins blinking.

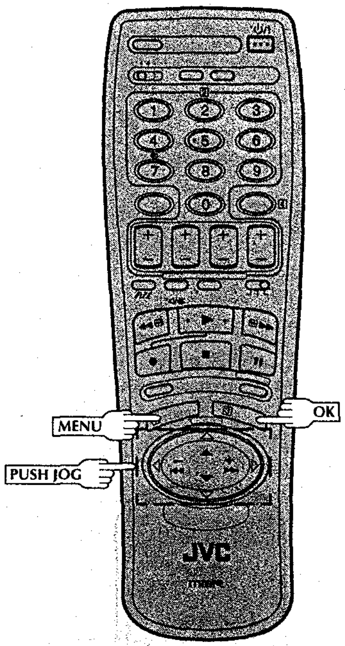
3 ENTER NEW CHARACTER

Press **PUSH JOG**△▽ to cycle through the characters (A–Z, 0–9, –, ∗, +, ＿(space)) and stop when the desired one is indicated, then press **PUSH JOG**▷ to enter. Enter the remaining characters the same way (maximum of 4).
After entering all characters, press **OK**.

- Repeat steps **1** through **3** as necessary.
- If you make a mistake, press **PUSH JOG** ◁ until the incorrect character begins blinking. Then enter the correct character by pressing **PUSH JOG**△▽.

4 CLOSE CONFIRMATION SCREEN

Press **MENU**.



Perform steps **1** and **2** of "Storing Channels Manually" on page 40 to access the Confirmation screen before continuing.

Fine-Tuning Channels Already Stored

1 SELECT CHANNEL TO FINE-TUNE

Press **PUSH JOG**△▽◁▷ until the channel you want to tune begins blinking.

2 ACCESS MANUAL CH. SET SCREEN

Press **OK** three times. The Manual Ch. Set screen appears.

3 PERFORM TUNING

Press **PUSH JOG**△▽ until the picture is its clearest. Then press **OK**.

- The Confirmation screen appears.
- Repeat steps **1** through **3** as necessary.

4 CLOSE CONFIRMATION SCREEN

Press **MENU**.

TV Station And ID List

STATION NAME	ID*
Anglia TV	ANGL
ARD	ARD
ARTE	ARTE
BBC Group	BBC
BBC1	BBC1
BBC2	BBC2
Berlin 1	BLN1
Berlin 2	BLN2
Border TV	BORD
Bayern1	BR1
Bayern3	BR3
BRT1	BRT1
BRT2	BRT2
Children Ch	CHLD
Canal +	CH+
CNN	CNN
Channel TV	CHNL
Central TV	CNTR
Channel 4	CH 4
Channel 5	CH 5
DRS	DRS
DR TV	DRTV
DSF	DSF
Euronews	EURN
Euronews	EURO
Eurosports	EURS
France1	FR1
France2	FR2
France3	FR3
Granada TV	GRNA
Grampian TV	GRMP
Hessen1	HR1
Hessen3	HR3
HRT	HRT
HTV	HTV
ITV Network	ITV
Kabelkanal	KABL
London	LNDN
MDR	MDR
MTV	MTV
Nord3	N3
NDR1	NDR1
NDR3	NDR3
NED1	NED1
NED2	NED2
NED3	NED3
Network 2	NET2
NRK	NRK
N-TV	N-TV
Offener Kanal	OKAN
ORF1	ORF1
ORF2	ORF2
ORF3	ORF3
OWL 3	OWL3
Premiere	PRM1
PR07	PR07
RAI1	RAI1
RAI2	RAI2
RAI3	RAI3
RB1	RB1
RB3	RB3
Rikisutvarpid-S	RKPS
RTBF 1	RTB1
RTBF 2	RTB2
RTE 1	RTE1
RTL	RTL
RTL 2	RTL2
RTP	RTP

STATION NAME	ID*
SAT	
SAT 1	SAT1
Scottish TV	SCOT
SC4	SC4
SDR	SDR
SDR1	SDR1
SFB1	SFB1
SFB3	SFB3
SKY	
Sky One	SKY1
Sky Net	SKYN
Sport	SPRT
SR 1	SR1
Super RTL	SRTL
STV Test	STVT
STV 1	STV1
STV 2	STV2
Suedwest3	SW3
SWF 1	SWF1
Schweiz4	SWZ4
TYNE TEES	TEES
Text	TEXT
TF1	TF1
TNT int	TNT
TRT int	TRT
TSI	TSI
TSR	TSR
TSW	TSW
TVE	TVE
TV Polonia	TVPA
TVP 1	TVP1
TVP 2	TVP2
TVS	TVS
TV2	TV2
TV5	TV5
Tele Zurich	TZUR
Ulster TV	ULST
Veronica	VERN
VIVA	VIVA
VIVA2	VIV2
VOX	VOX
VTM	VTM
VT4	VT4
West1	WDR1
West3	WDR3
YLE 1	YLE1
YLE 2	YLE2
Yorkshire TV	YORK
ZDF	ZDF
Zurich 1	ZUR1
3SAT	3SAT

* The "ID" abbreviation is what is shown on-screen in lieu of the station name. The "ID" abbreviation is listed in the Confirmation screen and is displayed on the TV screen when the recorder is tuned to a different station.

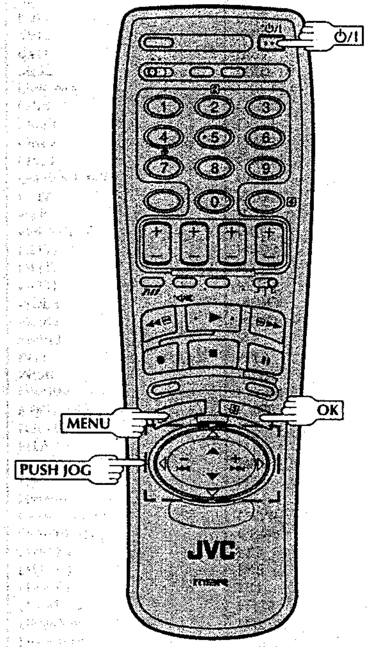
TV Station Channel Number Guide

Only the main stations are listed. There are in addition many relay stations, and full lists are available from BBC and ITC.

	BBC1	BBC2	ITV	CH4
London & South-East				
Bluebell Hill	40	46	43	65
Crystal Palace	26	33	23	30
Dover	50	56	66	53
Heathfield	49	52	64	67
Oxford	57	63	60	53
South-West				
Beacon Hill	57	63	60	53
Caradon Hill	22	28	25	32
Huntshaw Cross	55	62	59	65
Redruth	51	44	41	47
Stockland Hill	33	26	23	29
Channel Islands Fremont Point	51	44	41	47
South				
Hannington	39	45	42	66
Midhurst	61	55	58	68
Rowridge	31	24	27	21
West				
Mendip	58	64	61	54
East				
Sandy Heath	31	27	24	21
Sudbury	51	44	41	47
Tacolneston	62	55	59	65
Midlands				
Ridge Hill	22	28	25	32
Sutton Coldfield	46	40	43	50
The Wrekin	26	33	23	29
Waltham	58	64	61	54
North				
Belmont	22	28	25	32
Emley Moor	44	51	47	41

	BBC1	BBC2	ITV	CH4
North-West				
Caldbeck	30	34	28	32
Winter Hill	55	62	59	65
North-East				
Bilsdale West Moor	33	26	29	23
Chatton	39	45	49	42
Pontop Pike	58	64	61	54
Scotland				
Angus	57	63	60	53
Black Hill	40	46	43	50
Sandale	22	—	—	—
Caldbeck	—	34	28	32
Creigkelly	31	27	24	21
Darvel	33	26	23	29
Durris	22	28	25	32
Eitshal	33	26	23	29
Keelylang Hill	40	46	43	50
Knock More	33	26	23	29
Rosemarkie	39	45	49	42
Rumster Forest	31	27	24	21
Selkirk	55	62	59	65
Wales				
Blaenplwyf	31	27	24	21
Carmel	57	63	60	53
Llanddona	57	63	60	53
Moel-y-Parc	52	45	49	42
Presely	46	40	43	50
Wenvoe	44	51	41	47
Northern Ireland				
Brougher Mountain	22	28	25	32
Divis	31	27	24	21
Limavady	55	62	59	65

Turn on the TV and select the VIDEO channel (or AV mode).



IMPORTANT
Perform the following steps only if Auto Clock Set has not been performed correctly by Auto Set Up (☞ pg. 8) or Auto Channel Set (☞ pg. 38) or if the recorder's memory backup has expired.

If you performed Auto Set Up or Auto Channel Set without ever having set the clock previously, the recorder's built-in clock is also set automatically. The Auto and Manual clock setting procedures are necessary when . . .
- a power outage of more than 3 minutes occurs.
- the tuner has been set manually.
- the user desires to set the clock slightly ahead of the actual time.
- the clock was not set even after Auto Set Up or Auto Channel Set was performed.

Whether you perform Auto or Manual clock setting, you can use the convenient Just Clock function.

Just Clock
The Just Clock function provides accurate time keeping through automatic adjustments at regular intervals, by reading data from a PDC signal.
The Just Clock option appears in the Clock Set and Auto Clock Set screens, and can be set "ON" or "OFF" (the default setting is "ON"). Press **OK** until the Just Clock setting begins blinking, then press **PUSH JOG**△▽ to change the setting.
IMPORTANT: If you turn off Just Clock off, the accuracy of your recorder's built-in clock may be reduced, which could adversely effect timer recording.

Both Auto and Manual clock setting procedures begin from step **4**.

Preparation

1 TURN THE RECORDER ON

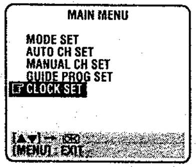
Press ⏻/I.

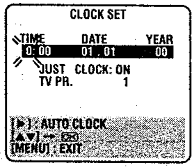
2 ACCESS MAIN MENU SCREEN

Press **MENU** twice.

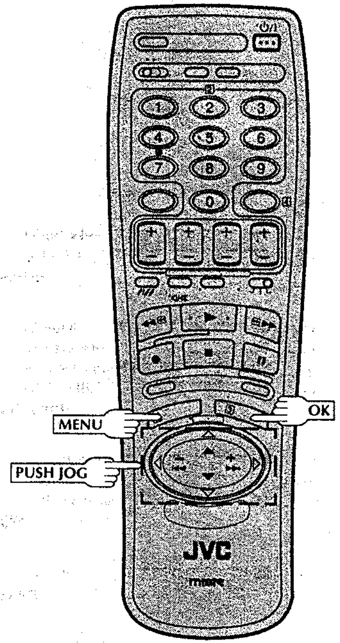
3 ACCESS CLOCK SET SCREEN

Move the highlight bar (pointer) to "CLOCK SET" by pressing **PUSH JOG** △▽, then press **OK**. The Clock Set screen appears.





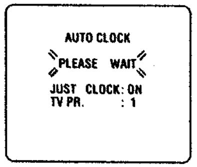
0:00 01 . 01 00
JUST CLOCK: ON
TV PR. 1



Auto Clock Set

4 SET CLOCK AUTOMATICALLY

At the Clock Set screen, press **PUSH JOG**▷. The Auto Clock Set screen appears and clock setting begins.



JUST CLOCK: ON
TV PR. : 1

- If "TV PR." isn't set to the preset position on which Auto Clock Set data is received, "ERROR" appears, and then the screen from step **3** reappears. To set "TV PR.", press **OK** to place the cursor next to it, then cycle through the numbers by pressing **PUSH JOG**△▽ until the number representing the position in which the station transmitting clock setting data (BBC1, BBC2, etc.) is stored appears.

5 RETURN TO NORMAL SCREEN

Once clock setting is completed, press **MENU** to return to the normal screen.

NOTES:

- *Just Clock (when set to "ON") adjusts the recorder's built-in clock every hour, except for 23:00, 0:00, 1:00 and 2:00.*
- *Just Clock is not effective when . . .*
  - *the recorder's power is on (unless the recorder is tuned to the same preset selected in the Clock Set screen).*
  - *the recorder is in the Timer mode.*
  - *a difference of more than 3 minutes exists between the built-in clock's time and the actual time.*
- *If Just Clock is set to "ON", the recorder's clock is automatically adjusted at the start/end of Summer Time.*
- *Auto clock setting and Just Clock may not function properly depending on the reception condition.*
- *During Manual clock setting, if the day and month data are invalid (such as 31st April), the month digits are cleared automatically and the day digits begin blinking. Input the correct data.*
- *If, in step **4** of the Manual clock setting procedure, the year digits are automatically cleared and the day digits begin blinking, it is possible that you have input 29th February for a non-leap year. Input the correct data.*

Manual Clock Set

4 SET DATE AND TIME

Press **PUSH JOG**△▽ to set the hour, then press **OK**. The "minutes" display begins blinking. Repeat the procedure to set the minutes, day, month and year.

5 SET JUST CLOCK

The default setting is "ON". Set as desired by pressing **PUSH JOG**△▽, then press **OK**.

- If you set to "OFF", you can disregard the next step as you won't be able to receive regular clock adjustments.

6 SET CLOCK DATA SOURCE PRESET

The recorder is preset to receive clock setting and adjustment data from preset position 1. Press **PUSH JOG**△▽ to set the preset position to the number representing the station transmitting clock setting data (BBC1, BBC2, etc.), then press **OK**.

7 START CLOCK OPERATION

Press **MENU**.

Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your video recorder off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No power is applied to the recorder.	• The mains power cord is disconnected.	Connect the mains power cord.
2. The clock is functioning properly, but the recorder cannot be powered.	• "◷" is displayed on the display panel with Auto Timer set to "OFF".	Press the **TIMER** button to turn the "◷" indicator off.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape does not run during recording.	• "⏸" is displayed on the display panel.	Press **PLAY** to turn the "⏸" indicator off.
2. The tape stops during rewind or fast-forward.	• "M" is displayed on the display panel.	Press **C.MEMORY** to deactivate the Counter Memory function and turn the "M" indicator off.
3. The tape will not rewind or fast-forward.	• The tape is already fully rewound or fast-forwarded.	Check the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The playback picture does not appear while the tape is running.	• If you're using the RF OUT connection . . . . . . the TV receiver's channel selector is not set to the VIDEO channel. . . . the recorder's VIDEO channel has not been correctly set. • If you're using the AV connection, the TV receiver is not set to the AV mode.	If you are using the RF OUT connection . . . . . . set the TV receiver to the VIDEO channel. (☞ pg. 6) . . . Perform "Video Channel Set" (☞ pg. 6) If you are using the AV connection, set the TV to its AV mode.
2. Noise appears during visual search.	• This is normal.	
3. Noise appears during normal playback.	• The automatic tracking mode is engaged.	Try manual tracking. (☞ pg. 14)
4. Noise appears during slow-motion playback.	• The automatic tracking mode is engaged.	Try manual tracking. (☞ pg. 14)
5. Noise appears during still playback.		Press **TV PROG.** + or – a few times to remove the noise bars from the screen.
6. (HR-J745EK only) Breaks are noticeable in Hi-Fi soundtrack.	• Automatic tracking is engaged.	Engage and adjust tracking manually. (☞ pg. 14)
7. The playback picture is blurred or interrupted while TV broadcasts are clear.	• The video heads may be dirty.	Consult your JVC dealer.

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording cannot be started.	• There is no cassette loaded, or the cassette loaded has had its Record Safety tab removed.	Insert a cassette, or using adhesive tape, reseal the slot where the tab was removed.
2. TV broadcasts cannot be recorded.	• "AU" has been selected as the input mode.	Set to the desired preset.
3. Tape-to-tape editing is not possible.	• The source (another video recorder, camcorder) has not been properly connected. • All necessary power switches have not been turned on. • The input mode is not correct.	Confirm that the source is properly connected. Confirm that all units' power switches are turned on. Set the input mode to "AU".
4. Camcorder recording is not possible.	• The camcorder has not been properly connected. • The input mode is not correct.	Confirm that the camcorder is properly connected. Set the input mode to "AU".

TIMER RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	• The clock and/or the timer have been set incorrectly. • The timer is not engaged.	Re-perform the clock and/or timer settings. Press TIMER and confirm that "◷" is displayed on the display panel.
2. On-screen timer programming is not possible.	• Timer recording is in progress.	Timer programming can't be performed while a timer recording is in progress. Wait until it finishes.
3. "◷" and "[oo]" on the display panel won't stop blinking.	• The timer is engaged but there's no cassette loaded.	Load a cassette with the Record Safety tab intact, or cover the hole using adhesive tape.
4. The cassette is automatically ejected, and "◷" and "[oo]" on the display panel won't stop blinking.	• The loaded cassette has had its Record Safety tab removed.	Remove the cassette and cover the hole with adhesive tape, or insert a cassette with the Record Safety tab intact.
5. "◷" blinks for 10 seconds and the Timer mode is disengaged.	• **TIMER** has been pressed when there are no programs in memory, or the timer record information has been programmed incorrectly.	Check the programmed data and re-program as necessary, then press **TIMER** again.
6. The cassette is automatically ejected, the power shuts off and "◷" and "[oo]" won't stop blinking.	• The end of the tape was reached during timer recording.	The programme may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire programme.
7. Video Plus+ does not timer-record properly.	• The recorder's preset positions have been set incorrectly.	Refer to "Guide Program Number Set" and re-perform the procedure (☞ pg. 10).

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Whistling or howling is heard from the TV during camcorder recording.	• The camcorder's microphone is too close to the TV. • The TV's volume is too high.	Position the camcorder so its microphone is away from the TV. Turn the TV's volume down.
2. When scanning channels, some of them are skipped over.	• Those channels have been designated to be skipped.	If you need the skipped channels, restore them (☞ pg. 40).
3. The preset cannot be changed.	• Recording is in progress.	Press **PAUSE** to pause the recording, change presets, then press **PLAY** to resume recording.
4. The remote control won't operate my TV or satellite receiver.	• The **TV/SAT./VCR** switch is in the wrong position.	Set the switch to the correct position.
5. Channel settings that were made manually seem to have changed or disappeared.	• After the manual settings were made, Auto Channel Set was performed.	Perform manual setting again.
6. No channels are stored in the recorder's memory.	• The TV aerial cable was not connected to the recorder when Auto Set Up was performed.	Connect the TV aerial cable to the recorder properly and turn off the recorder power once, then turn the recorder power back on again. The recorder will try Auto Set Up again (☞ pg. 8).

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?
A. The tape is automatically rewound to the beginning.

……

Q. Can the video recorder indefinitely remain in the still mode?
A. No. It stops automatically after 5 minutes to protect the heads.

……

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?
A. This is normal.

……

Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?
A. No, it is normal.

……

Q. Noise bars appear during multi-speed search. What's the problem?
A. This is normal.

……

Q. Other than preventing further recording, what effect does removing the Record Safety tab have?
A. It disables marking of index codes.

……

Q. Sometimes, during Index Search, the video recorder can't find the programme I want to see. Why not?
A. There may be index codes too close together.

……

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the beginning of the continuation of recording. Why does this happen?
A. This is normal. It reduces distortion at the pause and resume points.

……

Q. Can the video recorder indefinitely remain in the Record-Pause mode?
A. No. The video recorder shuts off automatically after 5 minutes to protect the heads.

……

Q. What happens if the tape runs out during recording?
A. The video recorder automatically rewinds it to the beginning.

……

TIMER RECORDING

Q. "○" and "◷" remain lit on the display panel. Is there a problem?
A. No. This is a normal condition for a timer recording in progress.

……

Q. Can I program the timer while I'm watching a tape or a TV broadcast?
A. You won't see the picture as it is replaced by the on-screen menu, but the audio from the program or tape you're viewing can be heard.

……

ATTENTION:
This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the recorder off and unplug the mains power cord. Then plug it in again and turn the recorder on. Take out the cassette. After checking the cassette, operate the unit as usual.

GENERAL

Power requirement	: AC 220 – 240 V∿, 50/60 Hz
Power consumption	: 24 W (HR-J745EK) : 20 W (HR-J249EK)
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 340 mm
Weight	: 4.3 kg
Format	: VHS PAL standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette
(LP)	: 480 min. with E-240 video cassette

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines/50 fields
Recording system	: DA4 (Double Azimuth) helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines
Frequency range	: 70 Hz to 10,000 Hz (Normal audio) 20 Hz to 20,000 Hz (Hi-Fi audio)(HR-J745EK only)
Input/Output	: 21-pin scart connector x 2 (IN/OUT x 1, IN x 1) RCA connector x 1 (IN x 1, OUT x 1) (HR-J745EK only)

TUNER/TIMER

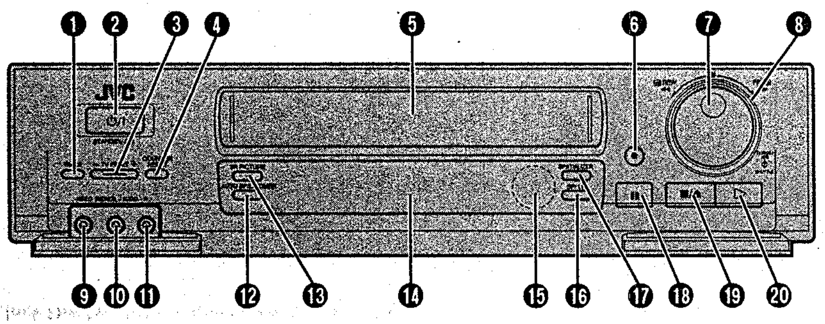
TV channel storage capacity	: 99 positions (+AUX position "AU")
Tuning system	: Frequency synthesized tuner
Channel coverage	: UHF channels 21 – 69 (470 – 862 MHz)
Aerial output	: UHF channels 22 – 69 (Adjustable)
Memory backup time	: Approx. 3 min.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E.& O.E. Design and specifications subject to change without notice.

FRONT VIEW



* With HR-J745EK, remove the cap to use the front panel connectors.

❶ **TIMER Button** engages timer standby mode. ☞ pg. 23, 25

❷ **STANDBY/ON ⏻/I Button** turns recorder on/off (loading a cassette also turns power on). ☞ pg. 8

❸ **TV PROG. +/– Buttons** select a preset position. ☞ pg. 18

❹ **COUNTER RESET Button** resets counter to 0:00:00. ☞ pg. 19

❺ **Cassette Loading Slot** is where cassette is inserted; door closes, "cassette loaded" indicator lights up on front display panel.

❻ **RECORD Button** starts regular recording (press once), Instant Timer Recording (press twice); sets duration of ITR. ☞ pg. 18, 19

❼ **TV PROG. Dial** scans to desired preset position during Stop mode. ☞ pg. 18
JOG Dial plays back frame by frame during Still or Play mode. ☞ pg. 13

❽ **SHUTTLE Ring** rewinds or fast-forwards tape during Stop mode ☞ pg. 12; performs forward and reverse slow-motion and search during Still or Play mode. ☞ pg. 13

❾ **VIDEO Input Connector** enables easy connection of video output from another recorder or camcorder for editing. ☞ pg. 30 (HR-J745EK only)

❿ **AUDIO Input Connector [L]** enables easy connection of audio output (mono) from another recorder, camcorder or other source for editing. ☞ pg. 30 (HR-J745EK only)

⓫ **AUDIO Input Connector [R]** enables easy connection of audio output (Hi-Fi) from another recorder, camcorder or other source for editing. ☞ pg. 30 (HR-J745EK only)

⓬ **AUTO SP/LP TIMER Button** engages Auto SP/LP Timer for automatic switching from SP to LP mode during timer recording. ☞ pg. 27

⓭ **3R PICTURE Button** enables/disables 3R Picture. ☞ pg. 15

⓮ **Display Panel** provides clear view of various displays and indicators. ☞ pg. 54, 55

⓯ **Infrared Beam Receiving Window** is where remote control should be aimed when in use.

⓰ **SP/LP Button** selects tape speed. ☞ pg. 18

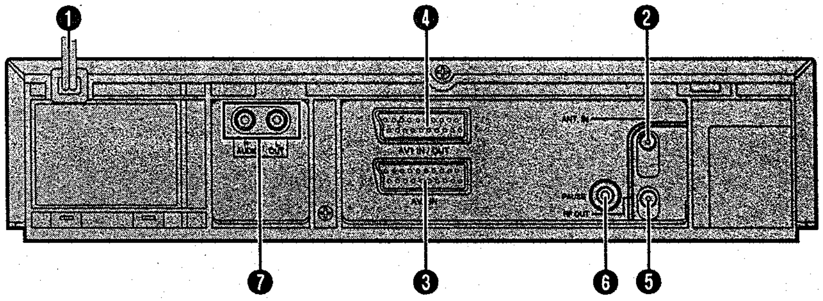
⓱ **SPATIALIZER Button** enables/disables Spatializer. ☞ pg. 16 (HR-J745EK)
REVIEW Button "reviews" timer-recorded programme. ☞ pg. 15 (HR-J249EK)

⓲ **PAUSE Button** stops tape temporarily during recording ☞ pg. 18; stops tape temporarily during playback; plays back frame by frame with each additional press. ☞ pg. 13

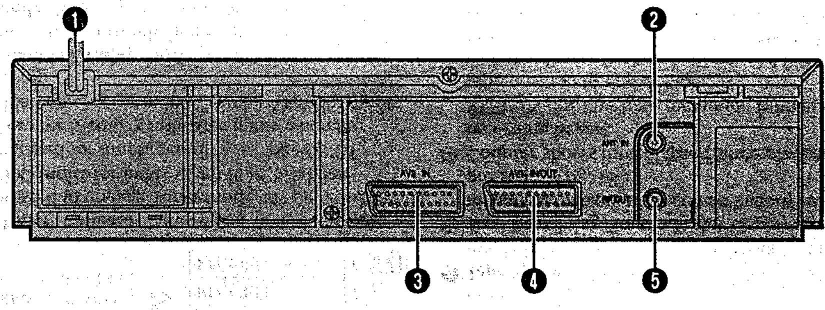
⓳ **STOP/EJECT Button** stops tape; ejects tape during Stop mode. ☞ pg. 12

⓴ **PLAY Button** plays back tape ☞ pg. 12; cancels Pause, Still, Slow, Search modes. ☞ pg. 13

REAR VIEW [J745EK]



REAR VIEW [J249EK]



❶ **Mains Power Cord** supplies power to recorder. ☞ pg. 4

❷ **ANT. IN Connector** enables connection of aerial. ☞ pg. 4

❸ **AV2 IN Connector** enables connection of satellite receiver or second recorder; input recordable when "AU 2" selected. ☞ pg. 32, 28

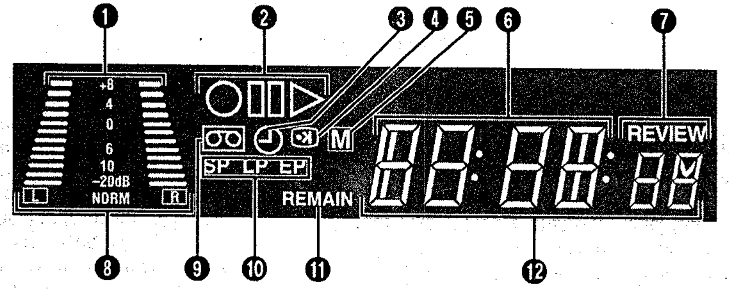
❹ **AV1 IN/OUT Connector** enables AV connection to TV or second recorder; input recordable when "AU-1" selected. ☞ pg. 4, 28

❺ **RF OUT Connector** enables connection to aerial terminal of TV receiver. ☞ pg. 4

❻ **Remote PAUSE Connector** enables connection to second recorder equipped with R.A. Edit connector, or to JVC camcorder equipped with Master Edit Control, for easy editing. ☞ pg. 30 (HR-J745EK only)

❼ **AUDIO OUT (L/R) Connectors** enable connection of audio cassette recorder, TV or second video recorder for dubbing. ☞ pg. 31 (HR-J745EK only)

DISPLAY PANEL [J745EK]



❶ **B.E.S.T. Picture System Display** lights from bottom to top while B.E.S.T. is active. ☞ pg. 20
Audio Level Indicator displays audio input and output levels.

❷ **Symbolic Mode Indicators**

PLAY: FF/REW VARIABLE SHUTTLE SEARCH:	▷	STILL: SLOW:	▯▯▷
		RECORD:	○
		RECORD PAUSE:	○▯▯

❸ **"Timer" Indicator** lights when the **TIMER** button has been pressed to engage Timer mode. ☞ pg. 23, 25

❹ **PDC Indicator** lights when PDC has been engaged for timer recording. ☞ pg. 22, 24

❺ **Counter Memory Indicator** lights when the video recorder is in the Counter Memory mode. ☞ pg. 15

❻ **Channel Display** shows preset position where the station currently being received is stored.
Mode shows external input mode selected.
Clock Display shows current time. ☞ pg. 9, 46

❼ **Instant REVIEW Indicator** blinks after timer-recording and shows how many programmes have been timer-recorded. ☞ pg. 15

❽ **Audio Mode Indicator** displays audio output mode currently selected. ☞ pg. 16

❾ **"Cassette Loaded" Mark** lights once a cassette is inserted; remains lit until cassette ejected or power turned off.

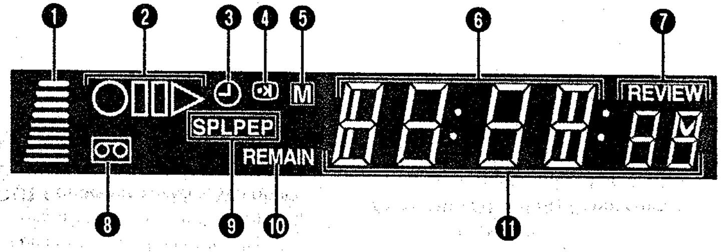
❿ **Tape Speed Indicators** display mode of recording; light during Record or Play mode. ☞ pg. 18

⓫ **Tape Remaining Time Indicator** displays time remaining on tape when certain buttons are pressed. ☞ pg. 19

⓬ **Counter** shows time elapsed since playback or recording began.
REMAIN displays time remaining from current tape position to end of tape.
Counter, Preset Position*, Clock and REMAIN Display appear alternately when **DISPLAY** is pressed.

** Preset Position is not displayed during playback.*

DISPLAY PANEL [J249EK]



❶ **B.E.S.T. Picture System Display** lights from bottom to top while B.E.S.T. is active. ☞ pg. 20

❷ **Symbolic Mode Indicators**

PLAY: FF/REW VARIABLE SHUTTLE SEARCH:	▷	STILL: SLOW:	▯▯▷
		RECORD:	○
		RECORD PAUSE:	○▯▯

❸ **"Timer" Indicator** lights when TIMER has been pressed to engage Timer mode. ☞ pg. 23, 25

❹ **PDC Indicator** lights when PDC has been engaged for timer recording. ☞ pg. 22, 24

❺ **Counter Memory Indicator** lights when the video recorder is in the Counter Memory mode. ☞ pg. 15

❻ **Channel Display** shows preset position where the station currently being received is stored.
Mode shows external input mode selected.
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❽ **"Cassette Loaded" Mark** lights once a cassette i inserted; remains lit until cassette ejected or power turned off.

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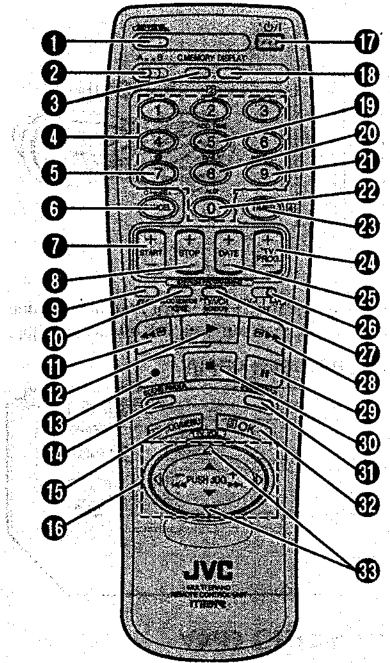
REMAIN displays time remaining from current tape position to end of tape.
Counter, Preset Position*, Clock and REMAIN Display appear alternately when **DISPLAY** is pressed.

** Preset Position is not displayed during playback.*

REMOTE CONTROL



Buttons with a small dot on the left side of the name can also be used to operate your TV with the **TV/SAT./VCR** switch set to "TV". ☞ pg. 36

① **REVIEW Button** "reviews" timer-recorded programme. ☞ pg. 15

② **A/B Code Switch** enables setting of recorder to respond to A- or B-code command signals. ☞ pg. 35

③ **C. MEMORY Button** engages Counter Memory mode. ☞ pg. 15

④ **NUMBER Keys** are used in preset position selection ☞ pg. 18, Video Plus+ timer programming ☞ pg. 22.

⑤ **⊡ (PDC) Button** enables/disables PDC recording. ☞ pg. 22, 25

⑥ **CANCEL Button** erases previously entered data in on-screen selection menus. ☞ pg. 11
C. RESET Button resets counter to 0:00:00. ☞ pg. 19

⑦ **START +/– Button** accesses Regular Program screen; inputs programme Start Time. ☞ pg. 24

⑧ **STOP +/– Button** inputs programme Stop Time. ☞ pg. 24

⑨ **SP/LP Button** selects tape speed. ☞ pg. 18
Auto Tracking Button enables/disables auto tracking mode during playback ☞ pg. 14
Digit Entry Button is used in controlling connected TV. ☞ pg. 36

⑩ **AUDIO MONITOR Button** changes output sound mode. ☞ pg. 16
🔈/🔇 (TV Mute) Button mutes sound of connected TV. ☞ pg. 36

⑪ **Rewind [REW] Button** rewinds the tape ☞ pg. 12; initiates high-speed reverse search. ☞ pg. 14

⑫ **Play Button** — same as button on recorder. ☞ pg. 12

⑬ **Record Button** — same as button on recorder. ☞ pg. 18

⑭ **SCENE FINDER Button** initiates cycle of 5-second forward (or reverse) search and 10-minute fast-forward (or reverse) on counter. ☞ pg. 17

⑮ **PROG./MENU Button** accesses Program screen (press once) or Main Menu screen (press twice). ☞ pg. 22, 10

⑯ **PUSH JOG △▽◁▷ Button** is used for selection in on-screen menus. ☞ pg. 10
PUSH JOG ◁▷ Button initiates functions such as Index Search ☞ pg. 15, variable-speed search, frame by frame playback. ☞ pg. 13; sets TV channels. ☞ pg. 36

⑰ **STANDBY/ON ⏻/I Button** — same as button on recorder. ☞ pg. 8

⑱ **DISPLAY Button** switches display between clock time, tape remaining time, counter readings, preset position*. ☞ pg. 19
** Preset position is not displayed during playback.*

⑲ **ADD TIME Button** adds time to end of Video Plus+ timer recording (5 minutes each time button is pressed.) ☞ pg. 23

⑳ **DAILY Button** enables timer recording of daily serials. ☞ pg. 23, 25

㉑ **WEEKLY Button** enables timer recording of weekly serials. ☞ pg. 23, 25

㉒ **AUX Button** selects recorder's auxiliary input mode. ☞ pg. 28

㉓ **TIMER Button** — same as button on recorder. ☞ pg. 23, 25

㉔ **TV PROG. +/– Button** — same as button on recorder. ☞ pg. 18

㉕ **DATE +/– Button** inputs date of program for timer recording. ☞ pg. 24

㉖ **TV/SAT./VCR Switch** enables remote control of VCR or connected TV or satellite receiver. ☞ pg. 36, 37

㉗ **TV/VCR Button** switches connected TV's mode between TV and AV. ☞ pg. 36

㉘ **Fast Forward Button** fast-forwards tape ☞ pg. 12; initiates high-speed forward search. ☞ pg. 14

㉙ **Pause Button** — same as button on recorder. ☞ pg. 13

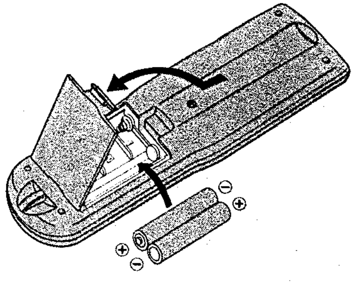
㉚ **Stop Button** — same as button on recorder. ☞ pg. 12

㉛ **PROG. CHECK Button** accesses Program screens/displays to check the program that you have programmed (next program's information screen appears each time button is pressed). ☞ pg. 26

㉜ **OK Button** enters selections made in on-screen menus. ☞ pg. 10

㉝ **TV VOL △▽ Button** controls volume of connected TV. ☞ pg. 36

Installing Batteries
1. Open the battery compartment cover.
2. Insert 2 "R6"-size batteries (provided) in the correct directions.
3. Replace the cover.



How To Use
The remote control can operate most of your video recorder's functions, as well as basic functions of TV sets and satellite receivers of JVC and other brands. ☞ pg. 36, 37.
- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

NOTE:
If for some reason the remote control doesn't work properly, remove its batteries, wait a short time and then try again.

JVC | VIDEO CASSETTE RECORDER
HR-J745EK/J249EK

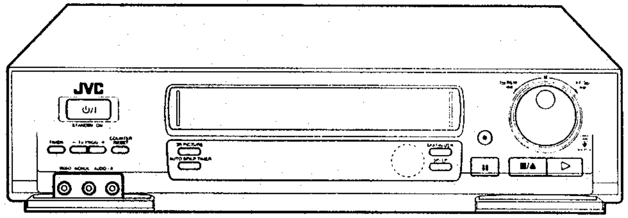
QUICK SET UP GUIDE

Dear Customer,

Thank you for purchasing this JVC Video Cassette Recorder.
Please use this QUICK SET UP GUIDE to help you to set up your video cassette recorder.

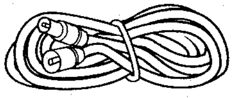
Step 1 CHECK THE CONTENTS

CAREFULLY UNPACK THE BOX AND CHECK ALL THE CONTENTS SHOWN BELOW

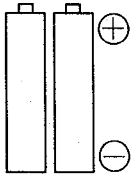


Video Cassette Recorder

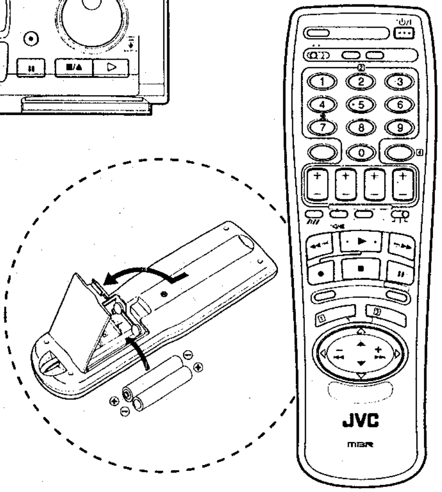
Unless otherwise specified, the recorder illustrations appearing in this QUICK SET UP GUIDE are HR-J745EK.



RF Cable



"R6" Batteries (x 2)



Infrared Remote Control Unit

EK Printed in Japan
0397 HOV*UN*VP

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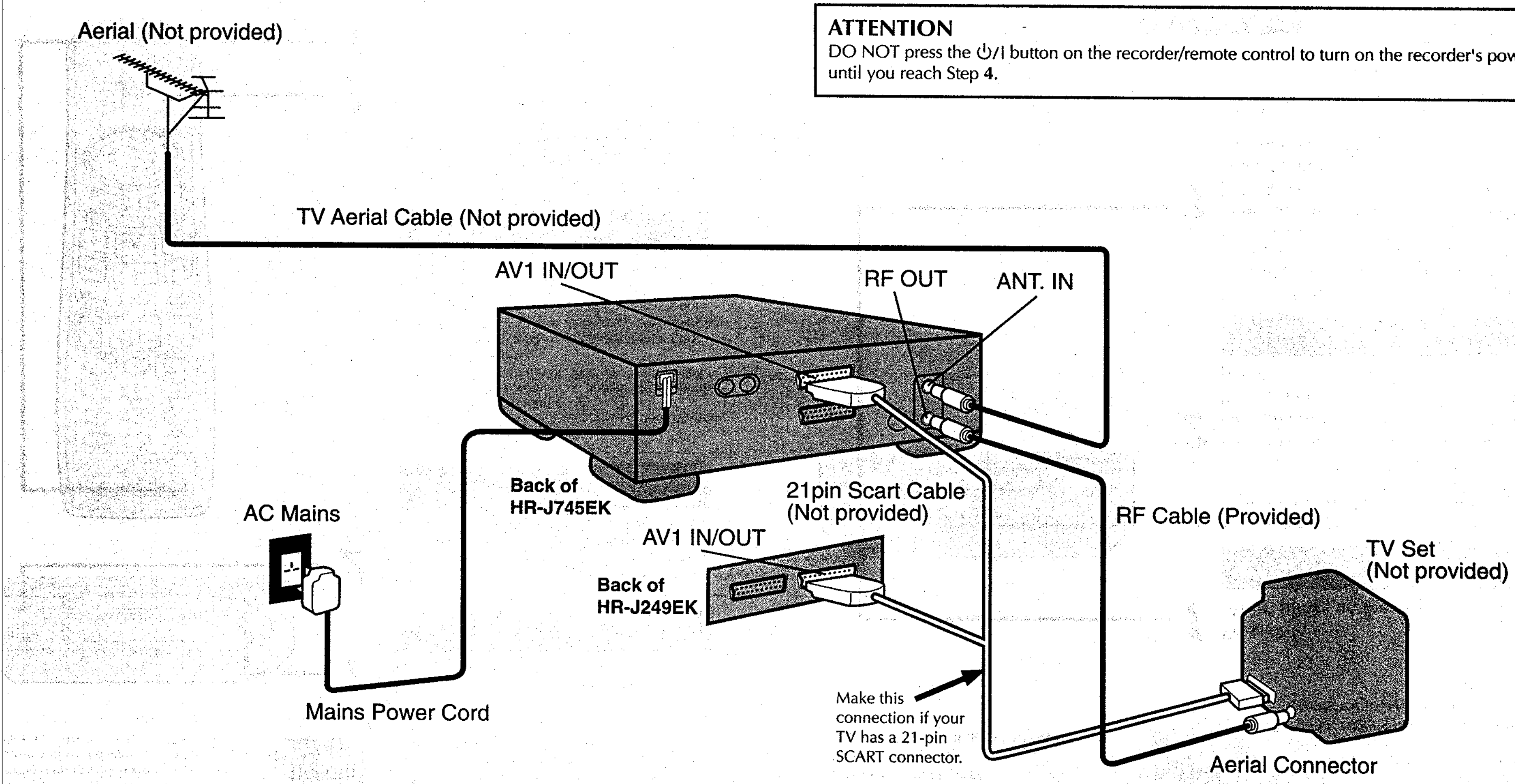
JVC
VICTOR COMPANY OF JAPAN, LIMITED

Step 2 INSTALLATION

ATTENTION
DO NOT press the ⏻/I button on the recorder/remote control to turn on the recorder's power until you reach Step **4**.


Aerial (Not provided)
TV Aerial Cable (Not provided)
AV1 IN/OUT
RF OUT
ANT. IN
Back of HR-J745EK
AC Mains
21pin Scart Cable (Not provided)
RF Cable (Provided)
AV1 IN/OUT
Back of HR-J249EK
TV Set (Not provided)
Mains Power Cord
Aerial Connector

Make this connection if your TV has a 21-pin SCART connector.

FOR MORE INFORMATION SEE INSTRUCTIONS/P4

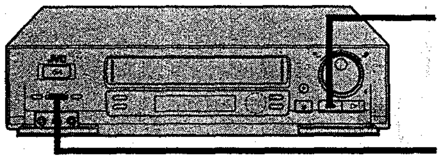
AFTER YOU FINISH THIS STEP ▷ ***Go to Step 3 – VIDEO CHANNEL SET***

Step 3 VIDEO CHANNEL SET

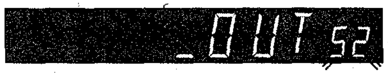
Video Channel (RF output channel) is the channel on which your TV receives picture and sound signals from the video recorder through the RF cable.

BEFORE YOU START

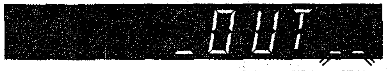
PLEASE MAKE SURE THAT:
- ■ The video recorder is turned off and there is no cassette inserted in the video recorder.
- ■ The connected TV is turned ON.
- ■ Load batteries into the remote control.



1 Hold down **STOP** on the recorder until the display panel shows the following.

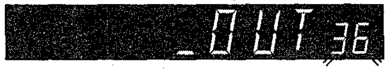


2
- If you have connected the video recorder to the TV set using both the provided RF cable and a SCART cable (AV connection), press **TV PROG.** – until the display panel shows "_OUT_ _" and go to item *3*.

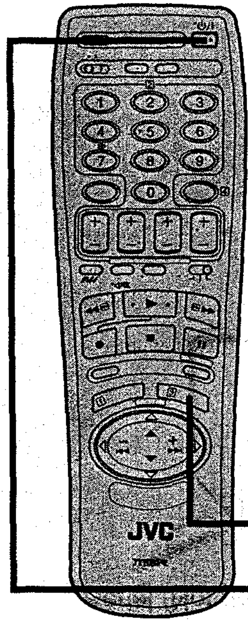


- If you have connected the video recorder to the TV set using the provided RF cable only (RF connection), set your TV to UHF channel 52.
  - If the two vertical white bars appear clearly on the screen as shown in the illustration at bottom left, go to item *3* below.
  - If the two vertical white bars do not appear clearly, press **TV PROG.** – or + to set the video recorder to a vacant channel between 22 and 69 which is not occupied by any local station in your area.

  (Ex.) If channel 36 is available in your area



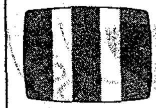
Then set your TV to UHF channel 36 and check if the two vertical white bars appear clearly on the screen; if so, go to item *3*. If not, re-set the video recorder to another vacant channel and try again.



3 Press **OK** to exit the Video Channel Set mode.

4 Press ⏻/I to turn off the recorder.

TEST SIGNAL



If you have connected the video recorder to your TV via RF connection, the channel on which the screen to the left appear clearly in item *2* is your Video Channel.

To view picture signals from the video recorder:
With AV connection, set your TV to its AV mode.
With RF connection, set your TV to the Video Channel.

FOR MORE INFORMATION SEE INSTRUCTIONS/P6

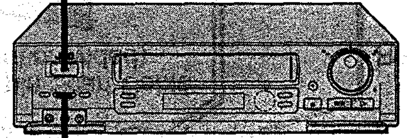
AFTER YOU FINISH THIS STEP ▷ *Go to Step 4 – AUTO SET UP*

Step 4 AUTO SET UP

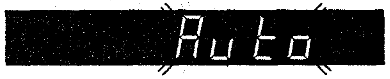
∗AUTO SET UP:
AUTO CHANNEL SET/
AUTO CLOCK SET/
AUTO GUIDE PROGRAM NUMBER SET

BEFORE YOU START

PLEASE MAKE SURE THAT:
- ■ The TV aerial cable is connected to the ANT. IN jack on the rear panel of the video recorder.
- ■ The recorder's mains power cord is connected to a mains outlet.

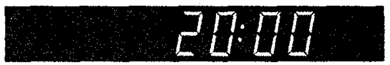


1 Press ⏻/I .
"Auto" blinks on the display panel.



- The tuner channels, clock and guide program number will be automatically set.

2 Do NOT press any button on the video recorder or remote control until the current time appears on the display panel.



- If "CH1" or "– –:– –" appears on the display panel, see page 7 of the instructions.

3 Make sure the TV is turned on and set to its Video Channel or AV mode, then press **TV PROG. +/–** to confirm all the channels stored by the video recorder.

FOR MORE INFORMATION SEE INSTRUCTIONS/P8

AFTER YOU FINISH THIS STEP ▷ *Go to Step 4 – VIDEO PLUS+ SETUP*

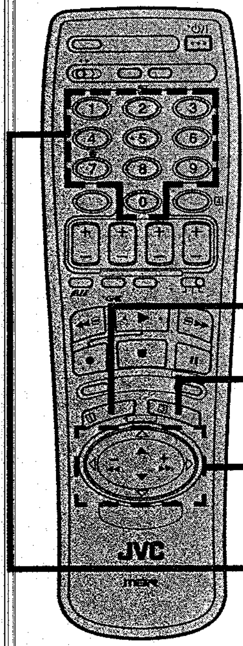
Step 5 VIDEO PLUS+ SETUP

Perform the following steps to check if the Guide Program numbers which is necessary for Video Plus+ timer recording have been correctly set during Auto Set Up, and make corrections accordingly.

BEFORE YOU START

PLEASE BE SURE TO:

- ■ Perform Video Channel Set.
- ■ Perform Auto Set Up.
- ■ Turn on the TV and select its Video Channel (or AV mode).



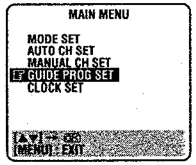
1 Make a list of the stored station names and their preset positions.

(Ex.)

Preset position	Station name
1	BBC1
2	BBC2
3	ITV
4	CH4
5	CH5

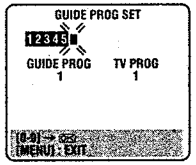
2 Press **MENU** twice to access the Main Menu screen.

3 Press **PUSH JOG** △▽ to move the highlight bar (pointer) to "GUIDE PROG. SET", then press **OK** twice.

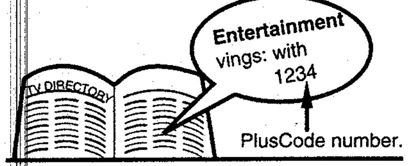

MAIN MENU
MODE SET
AUTO CH SET
MANUAL CH SET
GUIDE PROG SET
CLOCK SET
[▲▼] → OK
[MENU] : EXIT

4 Press the **NUMBER** keys to input the PlusCode number (found in most TV listings) of a program scheduled to be broadcast on each station on the list from item *1* above, starting at the top.

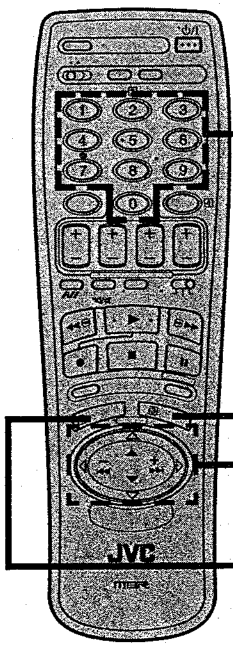
- If you enter the wrong number, press **CANCEL** to backspace and re-enter.


GUIDE PROG SET
12345
GUIDE PROG
1
TV PROG
1
[0-9] → OK
[MENU] : EXIT

When entering a PlusCode for BBC2

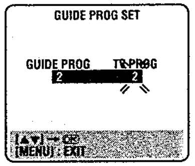

TV DIRECTORY
Entertainment
vings: with
1234
PlusCode number.

Video Plus+ and PlusCode are trademarks of Gemstar Development Corporation.
The Video Plus+ system is manufactured under license from Gemstar Development Corporation.



5 Press **OK** and the display under "TV PROG." begins blinking.

- *If the blinking number under "TV PROG." agrees with the preset position, press **OK**.*
- *If the number do not agree, press the **NUMBER** keys or **PUSH JOG** △▽ to input the preset position, and then press **OK**.*


GUIDE PROG SET
GUIDE PROG
2
TV PROG
2
[▲▼] → OK
[MENU] : EXIT

Repeat items **4** and **5** as necessary.

6 Press **MENU** to return to the normal screen.

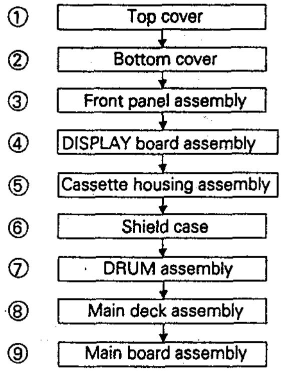
FOR MORE INFORMATION SEE INSTRUCTIONS/P10

TO PERFORM VIDEO PLUS+ TIMER RECORDING SEE INSTRUCTIONS/P22

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists shows the disassembly steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend,route and dress the flat cables as they were originally.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	5(S1)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSEMBLY	D3	7(L2),*JOG/SHUTTLE *CN705(HR-J249EK ONLY)	<NOTE 1>
④	DISPLAY BOARD ASSEMBLY	D4	12(L3),*CN1201, *CN1203(HR-J245EK ONLY)	<NOTE 2>
⑤	CASSETTE HOUSING ASSEMBLY	D5	2(S3),2(S4)	<NOTE 3>
⑥	SHIELD CASE	D6	2(S5),*CN101	
↑ (1)	↑ (2)	↑ (3)	↑ (4)	↑ (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	5(S1)	
②	BOTTOM COVER	D2	(S2), 7(L1)	
③	FRONT PANEL ASSEMBLY	D3	7(L2),*JOG/SHUTTLE *CN705(HR-J249EK ONLY)	<NOTE1>
④	DISPLAY BOARD ASSEMBLY	D4	12(L3),*CN1201, *CN1203(HR-J245EK ONLY)	<NOTE2>
⑤	CASSETTE HOUSING ASSEMBLY	D5	2(S3), 2(S4)	<NOTE3>
⑥	SHIELD CASE	D6	2(S5), *CN101	
⑦	DRUM ASSEMBLY	D7	3(S6), WR1	<NOTE4>
⑧	MAIN DECK ASSEMBLY	D8	2(S7), WR2, WR3, 2(L4), *CN703	<NOTE5>
⑨	MAIN BOARD ASSEMBLY	D9	3(S8)	

<NOTE1>
When reattaching the front panel assembly, make sure that the door opener (ⓐ) of the cassette housing assembly is lowered in position prior to the reinstallation.

<NOTE2>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE3>
When reattaching the cassette housing assembly, pay careful attention to the switch lever not to make it touch the REC switch knob of the REC SAFETY board assembly from the upside.
(If the REC switch knob of the REC SAFETY board assembly is damaged, cassette loading is impossible.)

<NOTE4>
When plugging the connector in, check that the flat wire is inserted properly and fully.

<NOTE5>
- When removing the Main deck assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Main deck assembly.
- When reattaching the Main deck assembly to the Main board assembly, make sure to set the spacers into the retaining slots respectively.

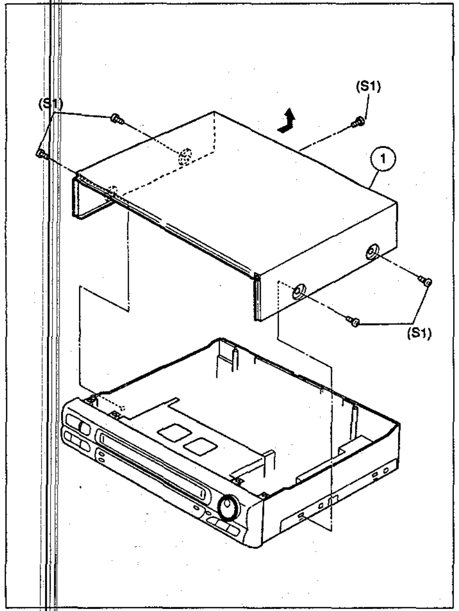


Fig. D1

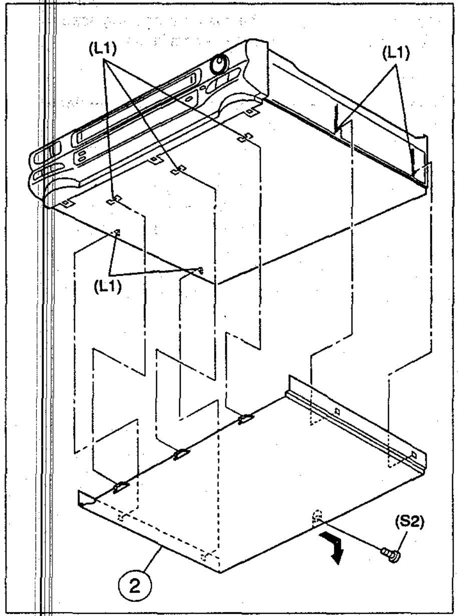


Fig. D2

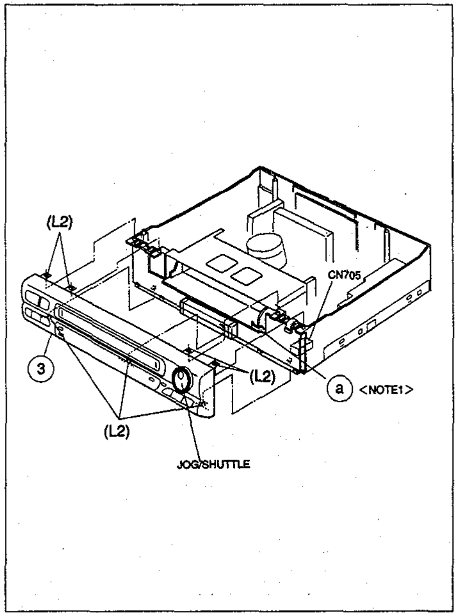

(L2)
CN705
③
(L2)
(L2)
a <NOTE1>
JOG/SHUTTLE

Fig. D3

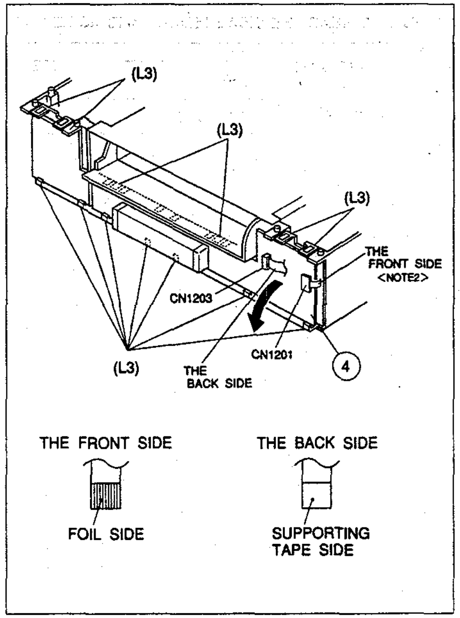

(L3)
(L3)
(L3)
THE FRONT SIDE <NOTE2>
CN1203
CN1201
(L3)
THE BACK SIDE
④
THE FRONT SIDE
FOIL SIDE
THE BACK SIDE
SUPPORTING TAPE SIDE

Fig. D4

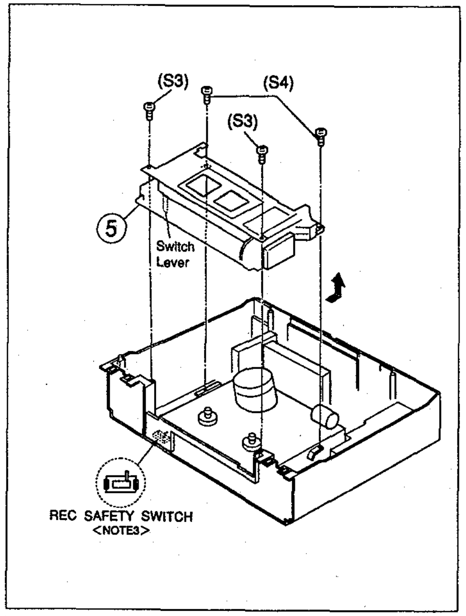

(S3)
(S4)
(S3)
⑤
Switch Lever
REC SAFETY SWITCH <NOTE3>

Fig. D5

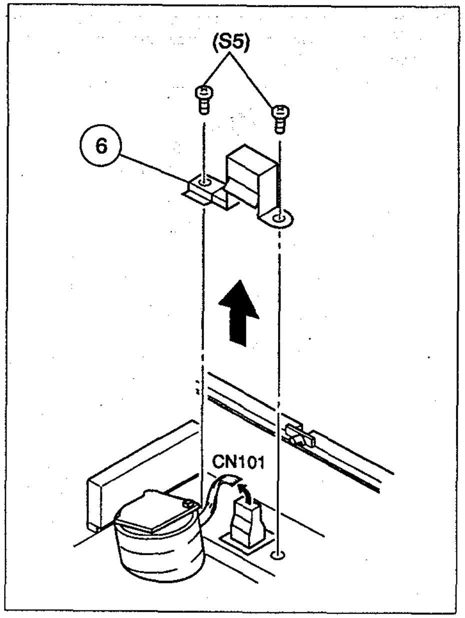


Fig. D6

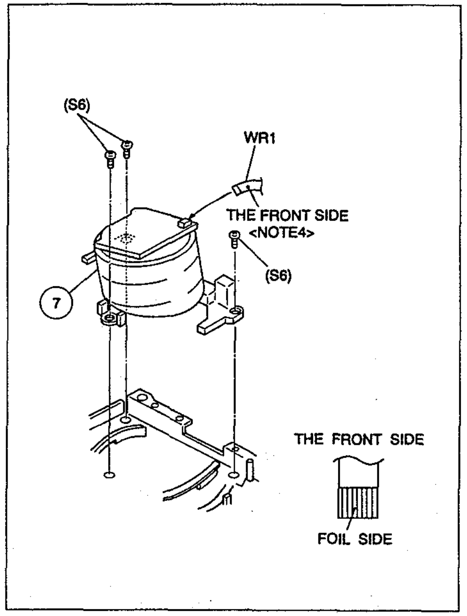

(S6)
WR1
THE FRONT SIDE <NOTE4>
(S6)
⑦
THE FRONT SIDE
FOIL SIDE

Fig. D7

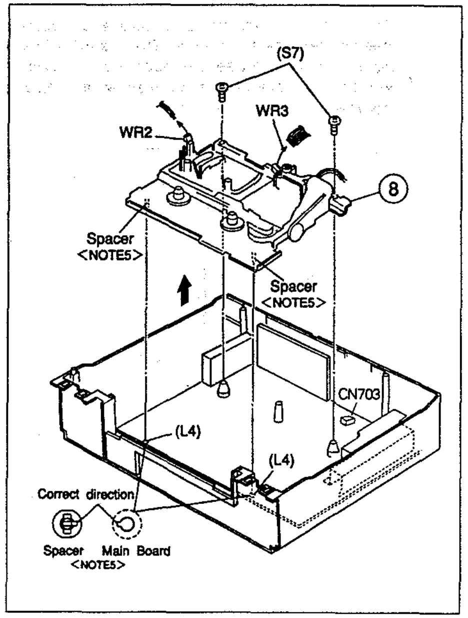

(S7)
WR3
WR2
⑧
Spacer <NOTE5>
Spacer <NOTE5>
CN703
(L4)
(L4)
Correct direction
Spacer
Main Board
<NOTE5>

Fig. D8

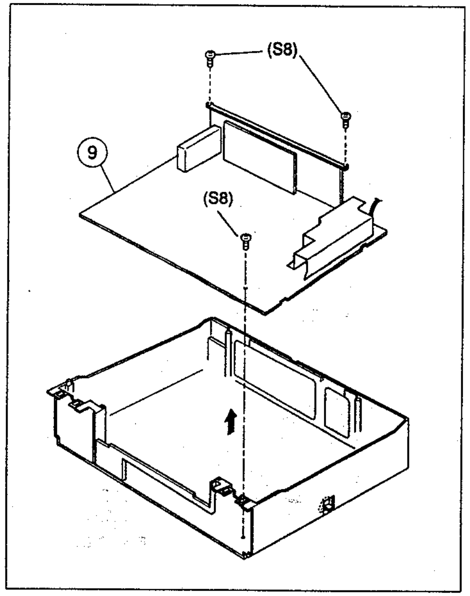


Fig. D9

1.4 CASSETTE HOUSING INSTALLATION

NOTE: *Observe the mechanical phase and position (see figure) when installing the cassette housing assembly. If these are incorrect, the system will not operate properly even when tape is inserted.*

1. Check that the hole of the control cam are aligned to the deck hole. If necessary, turn the loading motor belt by hand to adjust the position.

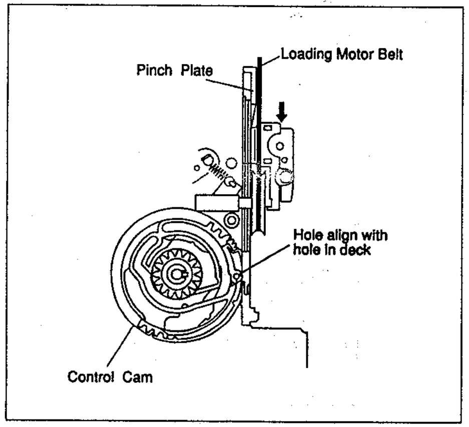


Fig. 1-4-1

1.5 SERVICE POSITION

1.5.1 How to take out the Mechanism and Main board assemblies.

(1) Remove the Top cover, Front panel assembly and CN1201 of DISPLAY board assembly.

(2) Take out 5 screws Ⓐ, 2 screws Ⓑ and 1 screw Ⓒ as shown in Fig.1-5-1.

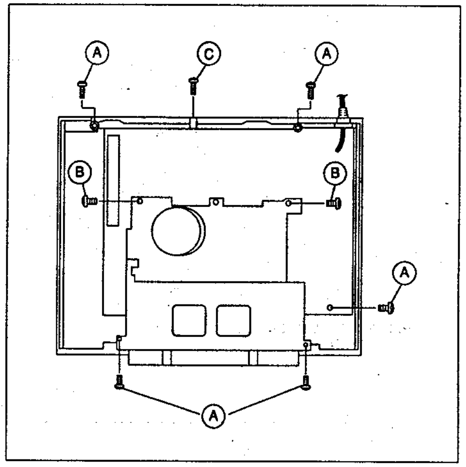


Fig. 1-5-1

(3) Remove the Mechanism assembly (including Cassette housing) and Main board assembly out of the chassis as shown in Fig. 1-5-2.

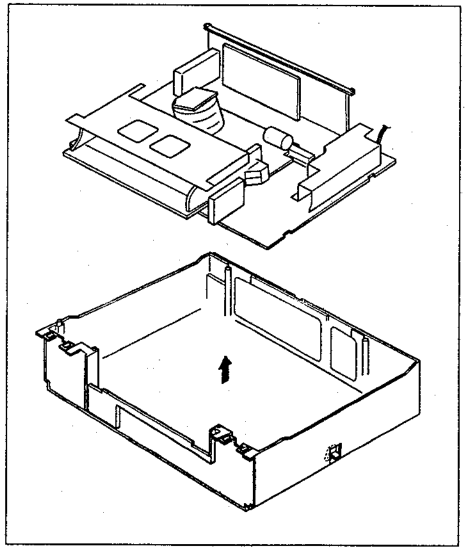


Fig. 1-5-2

(5) Turn over the Mechanism assembly and Main board assembly then connect CN1201of the DISPLAY board assembly.

(6) Carry out checks & repairs as necessary as shown in Fig.1-5-3.

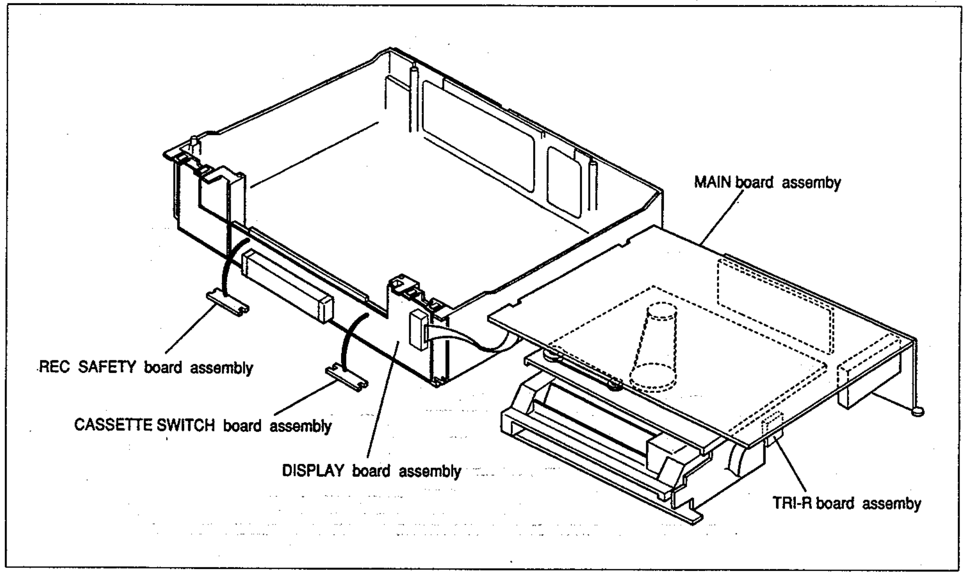


Fig. 1-5-3

1.5.2 Cautions on cassette loading when mechanism is in service position

The REC SAFETY board assembly of this set serves both for detecting the safety tab (erasure prevention tab) of a cassette and detecting a cassette loaded. Therefore, cassette loading in the condition that the mechanism is disassembled from the set needs manual operation of the switches of the REC SAFETY board assembly and the CASSETTE SWITCH board assembly.

1.5.3 Cassette loading and ejecting procedures when mechanism is in service position

(1) Insert a cassette tape halfway into the cassette housing assembly.

(2) Press the switch of the REC SAFETY board assembly to turn on.

(3) When the cassette loading begins and the cassette goes down to the bottom, immediately press the switch of the REC SAFETY board assembly to turn off and hold the status that the switch of the CASSETTE SWITCH board assembly is turned on. (Fix the switch with adhesive tape or put a screwdriver, etc. on it to leave the switch in the ON status.)

(4) In this status, desired operations (recording, playback, fast forward, rewind, etc.) can be performed.

Note: *When the mechanism is in the service position, the safety tab of cassette tape is not detected and recording on cassette tapes without safety tab is possible. Therefore, carefully choose a cassette tape for operation in this mode so as to avoid using cassette tapes of important recording.*

(5) For ejecting the cassette in this status, do it in the reverse order of cassette loading mentioned above.

Note: *If the manual operation REC SAFETY switch timing is incorrect, the cassette may be completely or partially ejected, and the cassette is often ejected incompletely. In such a case, it is possible to take out the cassette by hand.*

If it is desired to load a cassette again after the cassette is ejected in the above procedure, make sure to set the tray of the cassette housing assembly in the frontmost position prior to loading the cassette once again.

1.5.4 Opening on the chassis.

The chassis assembly has openings for easy access to the checkpoints and connector pins as shown in Fig.1-5-4.

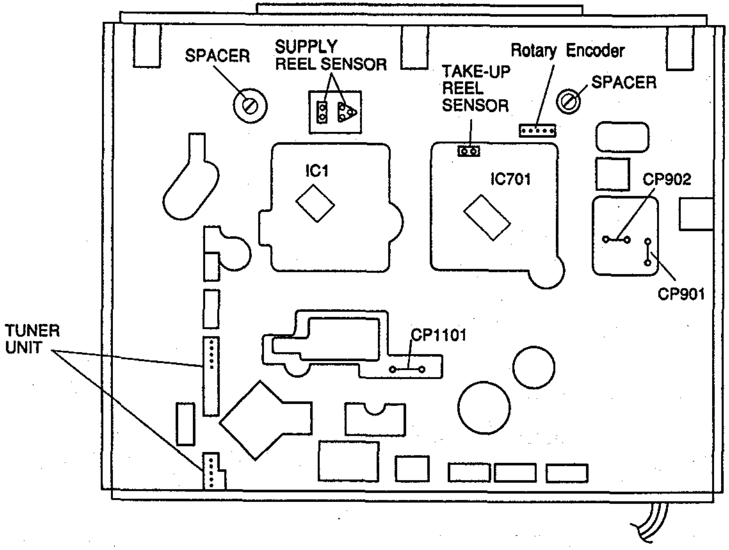

SPACER
SUPPLY REEL SENSOR
Rotary Encoder
TAKE-UP REEL SENSOR
SPACER
IC1
IC701
CP902
CP901
TUNER UNIT
CP1101

Fig. 1-5-4

1.6 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.6.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Remove the Top cover, Front panel assembly and cassette housing assembly. (See Page 1-2, 1-3)
(3) Connect TP1202 (GND) and TP1201 (TEST) on the DISPLAY board assembly with a jump wire.
(4) Connect VCR to AC.
(5) Press the POWER button.
(6) Select the desired operation modes with the operation buttons or remote controller.

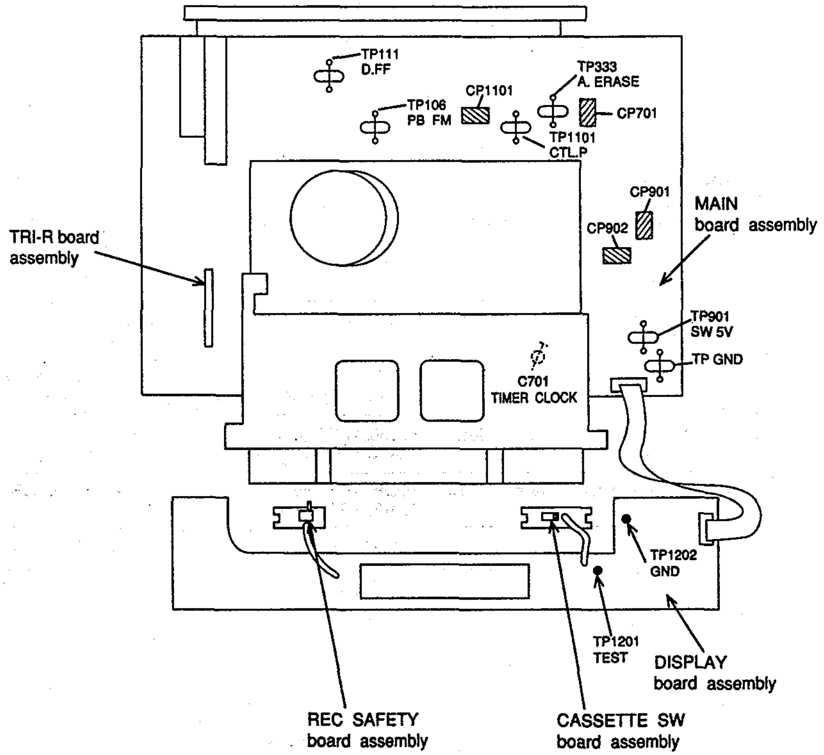

TP111 D.FF
TP333 A. ERASE
CP1101
TP106 PB FM
CP701
TP1101 CTL.P
CP901
CP902
MAIN board assembly
TRI-R board assembly
TP901 SW 5V
TP GND
C701 TIMER CLOCK
TP1202 GND
TP1201 TEST
DISPLAY board assembly
REC SAFETY board assembly
CASSETTE SW board assembly

Fig. 1-6-1

1.7 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.7.1 How to display record of an emergency faults

(1) Press "N" button of the presetting unit more than 2 seconds. and the two previous emergency faults are shown in the FDP.

(2) Press "N" button of the presetting unit again when return the normal mode.

[Example] E : 01 : 03
03 ← Emergency fault before last
01 ← Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.7.2 Detail of emergency faults

FDP	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent(for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent(for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP
E : 06	CAPSTAN FG input is absent(for more than 1 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-7-1 EMERGENCY FAULTS

1.7.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode,and the record of the emergency fault(s) is cleared.

SECTION 2

MECHANISM ADJUSTMENT

2.1 PREPARATION

2.1.1 Precautions

(1) Disconnect VCR from AC power before soldering.

(2) Avoid imparting stress to wires when disengaging connectors.

(3) Determine and correct the cause of difficulty before proceeding to adjustments.Do not disturb settings unnecessarily.

(4) Use care not to damage tabs,claws,etc during repairs.

(5) Install the cassette housing assembly only when the mechanism is in the MECHANISM ASSEMBLING MODE position.

(6) When installing the Front panel assembly,be sure to engage the housing door with the door opener of the cassette housing assembly.
If this is omitted,the cassette door will not open at Eject and the cassette can not be removed. (See SECTION 1 DISASSEMBLY.)

2.1.2 Check without cassette housing assembly.

Mechanism operations can be observed easily by removing the cassette housing assembly. Use the MECHANISM SERVICE MODE. (See SECTION 1 DISASSEMBLY.)

2.1.3 Manual removal of loaded tape

When the deck enters the emergency mode with cassette tape loaded and it can not be ejected by pressing the EJECT button,take out of the cassette tape according to the following procedure.

(1) Disconnect the power cord from AC outlet then take out the Top cover and Front panel assembly.

(2) Turn the loading motor on the Main deck assembly by hand in the unloading direction to where the pole base assembly (supply and take-up) is positioned below the cassette tape.At that time, pay careful attention to the tape not to get soiled with grease.

(3) Take out 4 screws of the cassette housing assembly.(See SECTION 1 DISASSEMBLY.)

(4) Remove the cassette housing with slackened tape and guard panel of cassette.

(5) Wind up the tape by turning the reel hub(either supply or take-up side for convenience) from the bottom of the cassette,and remove the cassette tape.

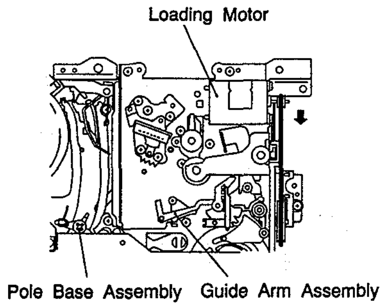


Fig. 2-1-1

2.1.4 Test Equipment

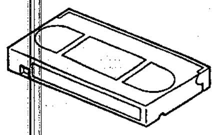
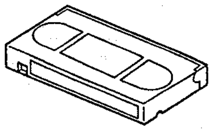
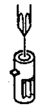
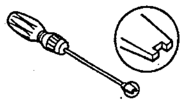
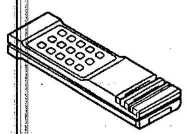
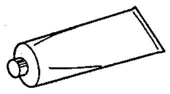
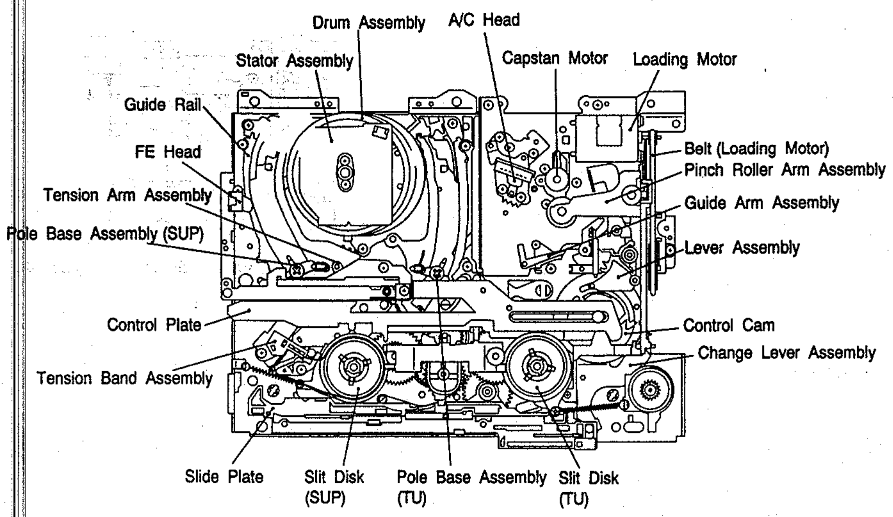
Alignment tape (SP) MHPE	Back tension cassette gauge PUJ48076-2	A/C head positioning tool PTU94010	Roller driver PTU94002
			
Presetting unit PTU94008	Grease KYODO-SH-P		
			

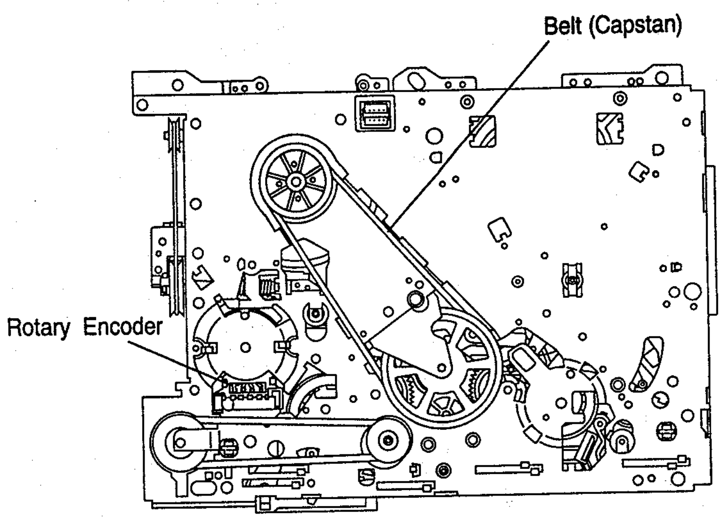
Table 2-1-1 Test equipment

2.2 MAIN MECHANISM PARTS



Drum Assembly
A/C Head
Stator Assembly
Capstan Motor
Loading Motor
Guide Rail
FE Head
Tension Arm Assembly
Pole Base Assembly (SUP)
Belt (Loading Motor)
Pinch Roller Arm Assembly
Guide Arm Assembly
Lever Assembly
Control Plate
Control Cam
Change Lever Assembly
Tension Band Assembly
Slide Plate
Slit Disk (SUP)
Pole Base Assembly (TU)
Slit Disk (TU)

Fig. 2-2-1 Top view of main deck



Belt (Capstan)
Rotary Encoder

Fig. 2-2-2 Bottom view of main deck

2.2.1 Cleaning

Periodic cleaning of the tape transport system is desirable,but usually not feasible in practice.Therefore,perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads,tape guides and brush can detract from playback picture quality and in extreme cases,even damage the tape.For cleaning,use a finemesh cotton cloth(about the texture of a white dress-shirt) moistened in alcohol. It is recommended to also clean thetape tension posts and capstan.

- To clean the video heads,press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke,as this may damage the heads.

2.2.2 Lubrication

Oil and grease do not normally require periodic replenishing. Apply only when replacing lubricated parts(also clean and replace lubrication of mating parts if soiled). For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly. Before oiling,clean with alcohol. Apply one or two drops of oil. Avoid excess oil.

1. Table 2-2-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

Category	Part No.
Oil	COSMO-HV56
Grease	KYODO-SH-P

Table 2-2-1

2. Grease is not required for a replacement cassette housing assembly,as this has been applied at the factory.

NOTE : *Stir grease that has been stored for an extended period.*

2.3 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear out in the course of usage.Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced as and when required.

2.3.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum motor assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Slit disk (supply, take-up)		○
	Clutch unit (supply, take-up)		○
	Worm gear assembly		○
	Control plate		○
	Slide plate		○
Other	Brush assembly	★○	★○
	Tension band assembly	○	○
	Rotary encoder		○

★ : Cleaning
○ : Inspection or Replacement if necessary

Table 2-3-1

2.4 DISASSEMBLY/ASSEMBLY PROCEDURE OF MECHANISM

2.4.1 Precaution before disassembling mechanism

This mechanism has an exclusive operation mode provided for disassembling and installation of the mechanism (MECHANISM ASSEMBLING MODE), and it is suggested to set the mechanism to this mode before disassembly and installation.The exclusive mechanism operation mode is not generally used and becomes available by manual setting only. Then this procedure starts with the condition that the cabinet parts,cassette housing assembly and PRE/REC board assembly have been removed.

2.4.2 How to set the exclusive mechanism operation mode (MECHANISM ASSEMBLING MODE)

(1) Turn the loading motor belt by hand.
(2) Confirm that the hole of the control cam are aligned to the deck hole as shown in Fig.2-4-1.

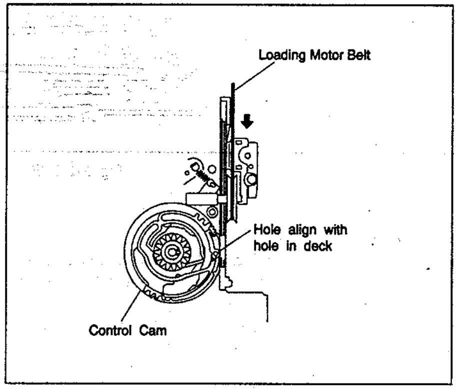


Fig. 2-4-1

2.5 MAIN PARTS REPLACEMENT OF MECHANISM

2.5.1 Pinch Roller Arm Assembly

(1) Remove the slit washer.
(2) Tilt up the pinch roller assembly in direction of arrow.

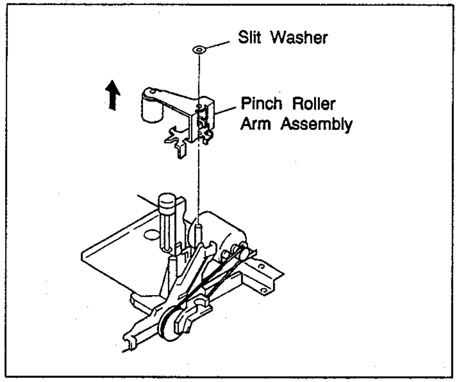


Fig.2-5-1

2.5.2 A/C Head

1. Removal

(1) Take out 2 screws (A).
(2) Remove the A/C head with head base.

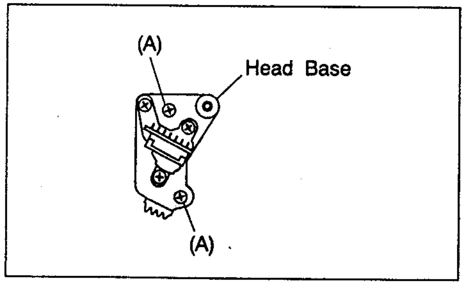


Fig.2-5-2

(3) When replacing the A/C head only,remove 3 screws (B), use care not to misplace the 3 springs.

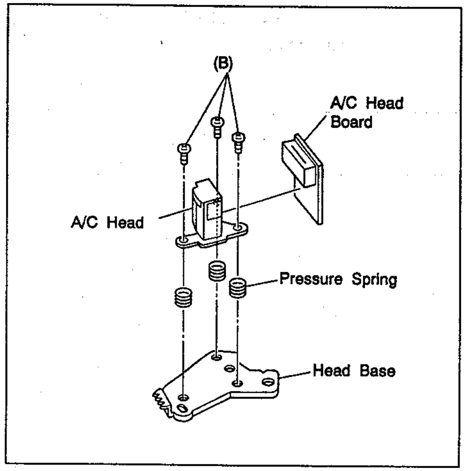
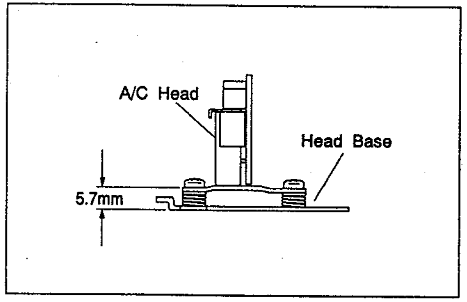


Fig.2-5-3

2. Installation

(1) Temporarily set A/C head height as indicated in Fig. 2-5-4.



NOTES:

- *It is very important to correctly adjust the control pulse and audio signal in addition to the mechanical tape path.*
- *Perform interchangeability adjustments after electrical adjustments.*

2.5.3 Pinch Plate

1. Removal

(1) Disengage 2 claws, then remove the pinch plate.

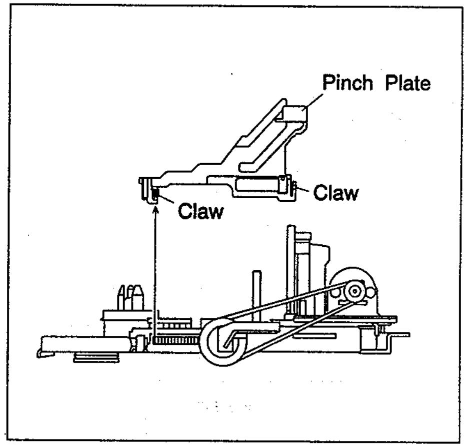


Fig.2-5-5

2. Installation

(1) When installing pinch plate,align rack of pinch plate and triangle mark of control cam as indicated in Fig.2-5-6.

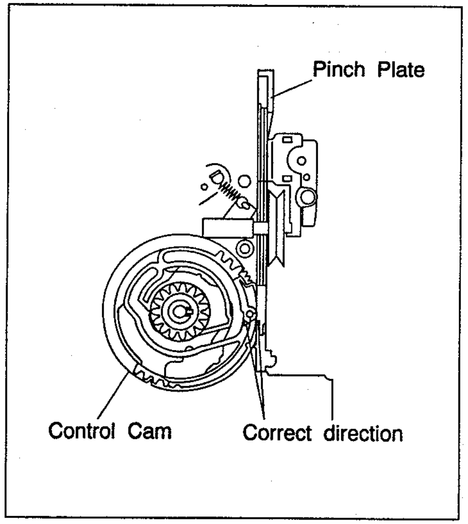


Fig. 2-5-6

2.5.4 Loading Motor

(1) Disengage the belt between loading motor and worm gear.
(2) Take out 2 screws (A) then remove the loading motor.

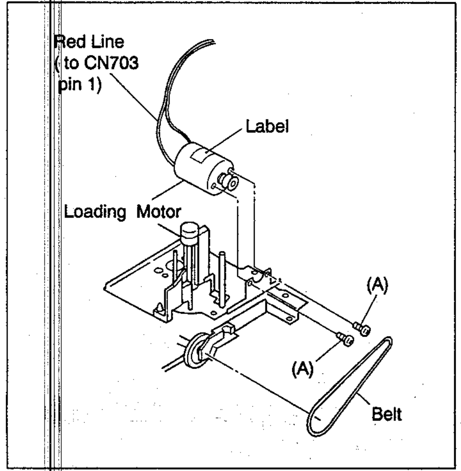

Red Line
(to CN703
pin 1)
Label
Loading Motor
(A)
(A)
Belt

Fig.2-5-7

2.5.5 Lever Assmebly,Sub Deck Assembly,Capstan Motor

(1) Take out 1 slit washer,then remove the lever assembly.
(2) Disengage the belt(capstan motor) from bottom of mechanism assembly first as indicated in Fig.2-5-10.
(3) Take out 2 screws (A), 1 screw (B) and remove the sub deck assembly as indicated in Fig.2-5-8.
(4) Take out 3 screws (C) and remove the capstan motor from the sub deck assembly as indicated in Fig.2-5-9.

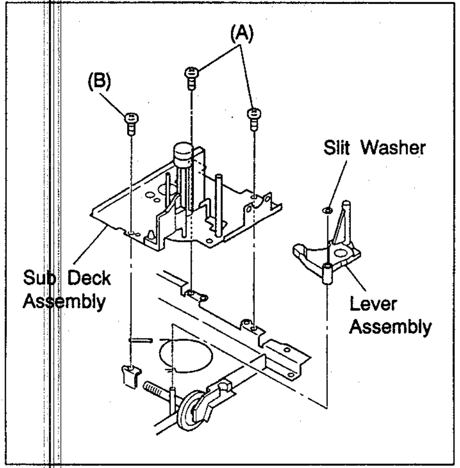

(A)
(B)
Slit Washer
Sub Deck
Assembly
Lever
Assembly

Fig.2-5-8

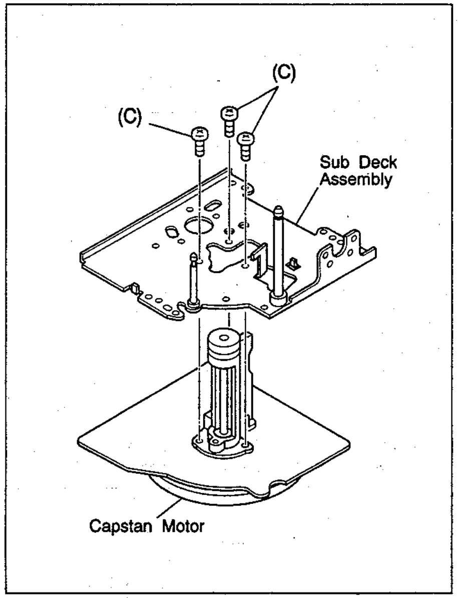

(C)
(C)
Sub Deck
Assembly
Capstan Motor

Fig.2-5-9

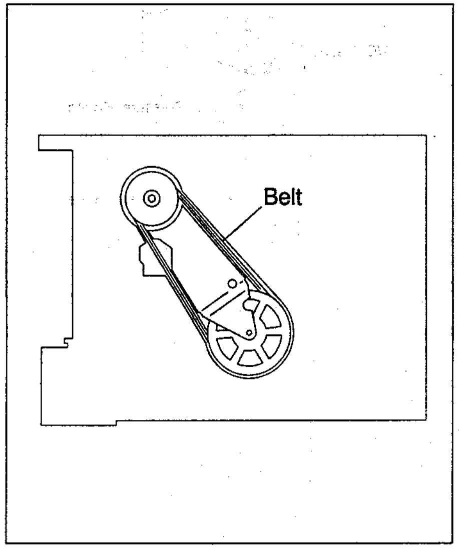


Fig.2-5-10

2.5.6 Control Bracket

(1) Take out 1 screw (A) and 1 screw (B).
(2) Remove the control bracket.

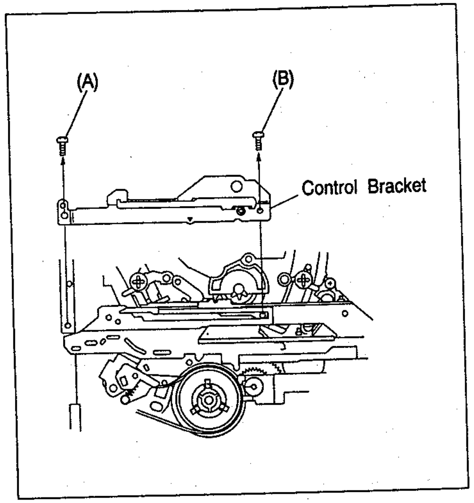

(A)
(B)
Control Bracket

Fig.2-5-11

2.5.7 Slit disk (take-up)

(1) Take out 1 slit washer.
(2) Remove the slite disk (take-up).

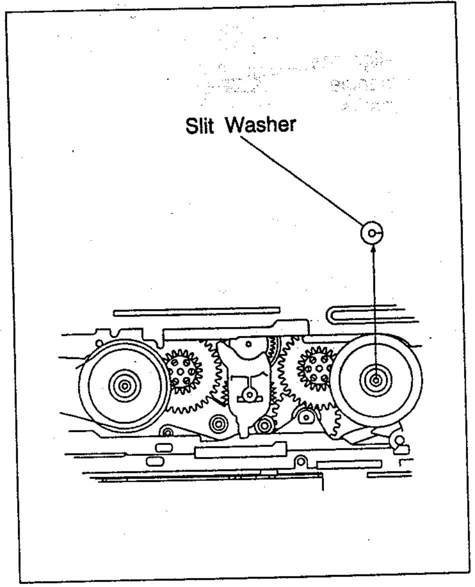

Slit Washer

Fig.2-5-12

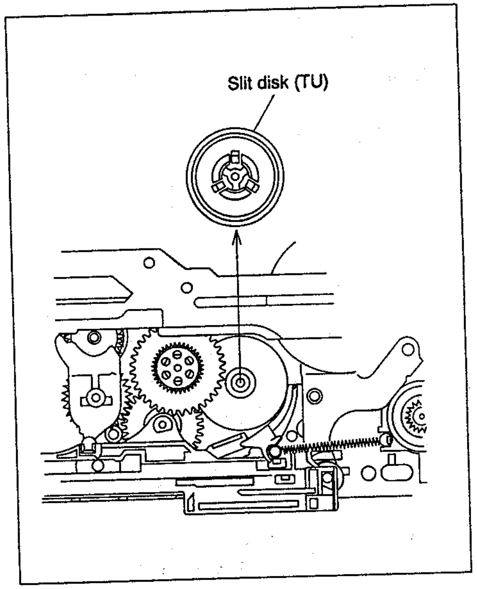

Slit disk (TU)

Fig.2-5-13

2.5.8 Control Plate

(1) Take out 1 slit washer.
(2) Disengage 2 claws and remove the control plate.

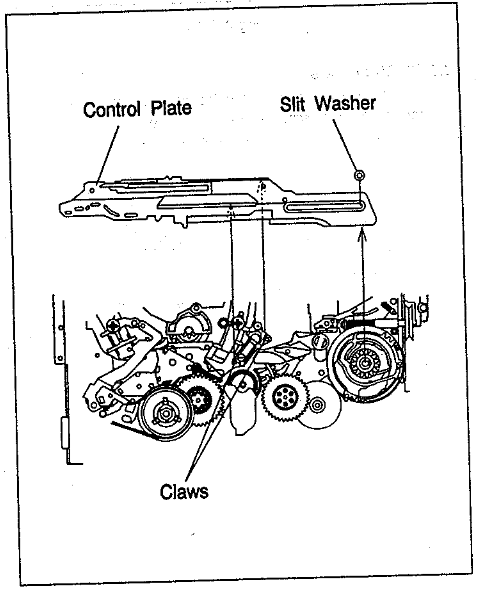
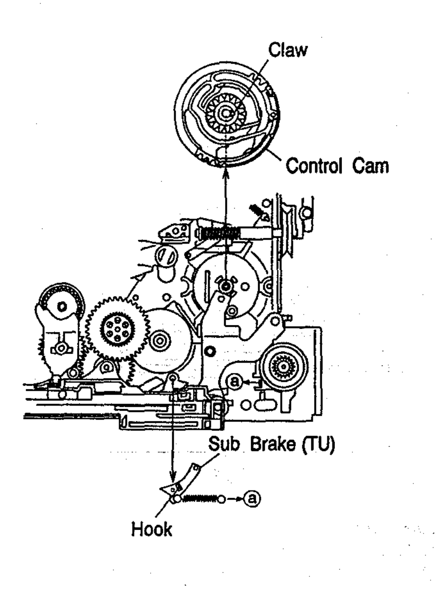

Control Plate
Slit Washer
Claws

Fig.2-5-14

2.5.9 Sub Brake(take-up),Control Cam

(1) Disengage 1 spring (a) and 1 claw then remove the sub brake (take-up).
(2) Disengage 1 claw and remove the control cam.

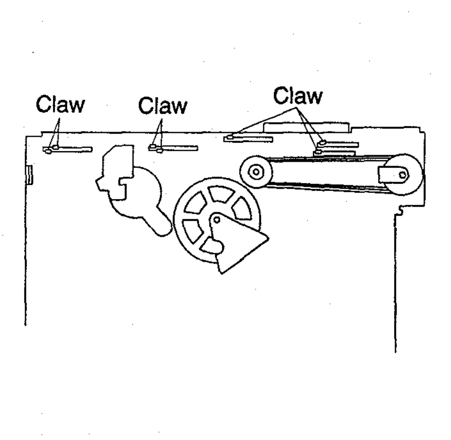


Claw
Control Cam
Sub Brake (TU)
ⓐ
Hook

Fig.2-5-15

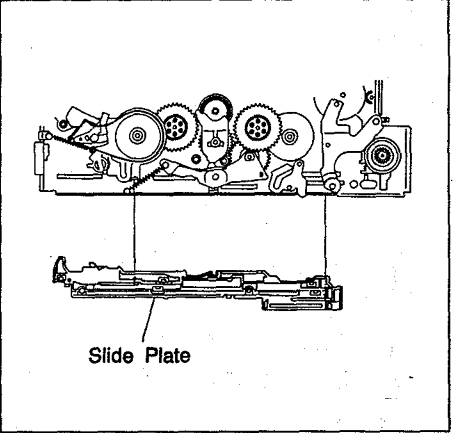
2.5.10 Slide Plate

(1) Disengage 7 claws from bottom of the mechanism assembly and remove the slide plate.



Claw
Claw
Claw

Fig. 2-5-16

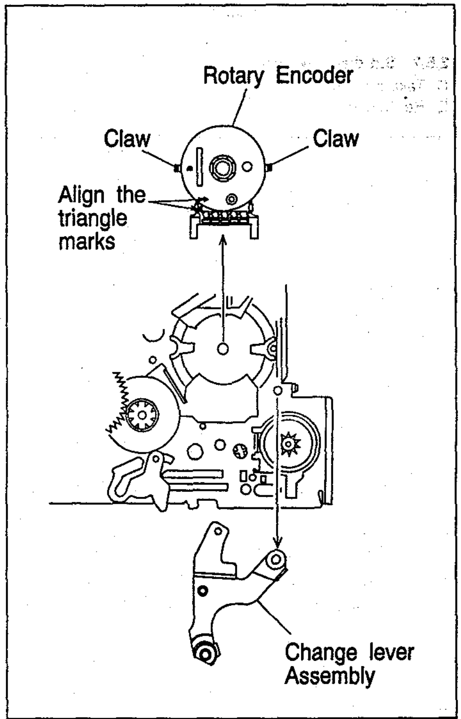


Slide Plate

Fig. 2-5-17

2.5.11 Change Lever,Rotary Encoder

(1) Remove the change lever.
(2) Disengage 2 claws and remove the rotary encoder.

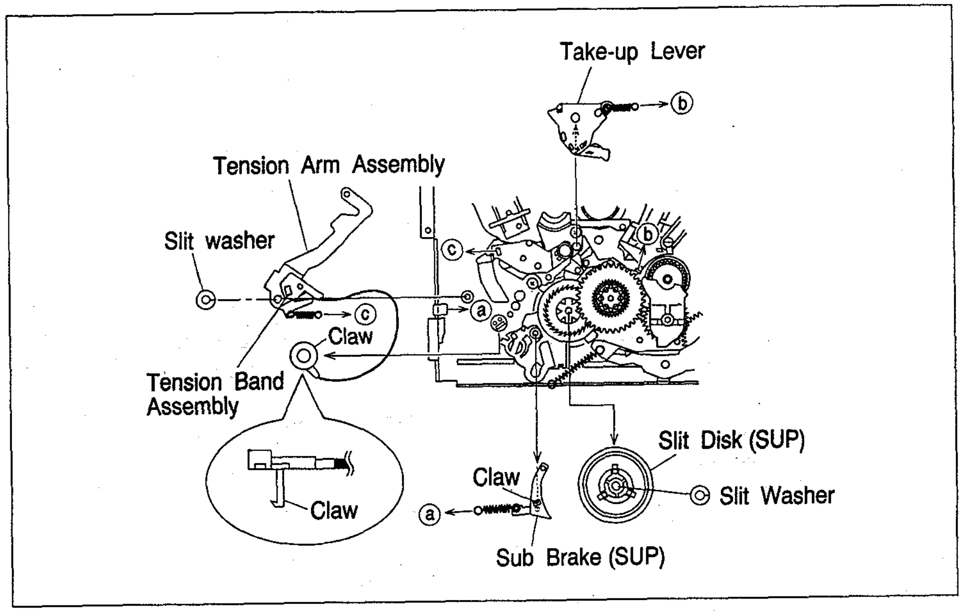


Rotary Encoder
Claw
Claw
Align the triangle marks
Change lever Assembly

Fig. 2-5-18

2.5.12 Sub Brake (supply),Tension Band Assembly, Tension Arm Assembly, Take-up Lever Assembly,Slit Disk(supply)

(1) Disengage 1 springⓐ.
(2) Disengage 1 claw and remove the sub brake (supply).
(3) Take out 1 spring Ⓒ and slit washer then disengage a claw.
(4) Remove the tension arm assembly with tension band assembly.
(5) Disengage 1 springⓑand remove the take-up lever assembly.
(6) Take out 1 slit washer then remove the slit disk(supply).

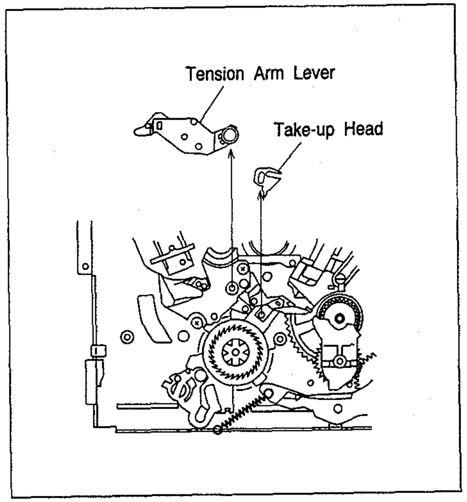


Take-up Lever
ⓑ
Tension Arm Assembly
Slit washer
ⓒ
Claw
Tension Band Assembly
ⓒ
ⓐ
ⓑ
Claw
Slit Disk (SUP)
Claw
ⓐ
Slit Washer
Sub Brake (SUP)

Fig. 2-5-19

2.5.13 Take-up Head,Tension Arm Lever

(1) Remove the take-up head and tension arm lever.



Tension Arm Lever
Take-up Head

Fig.2-5-20

2.5.14 Guide Rail

(1) Take out 5 screws Ⓐ and 1 screw Ⓑ.
(2) Disengage 4 claws and remove the guide rail.

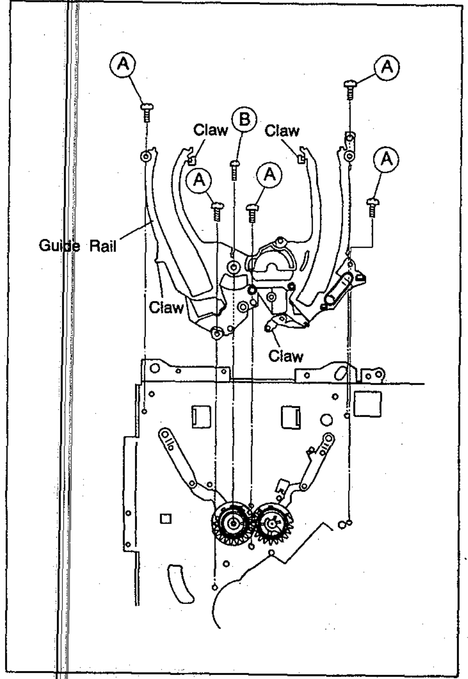

Ⓐ
Ⓐ
Ⓑ
Claw
Claw
Ⓐ
Ⓐ
Ⓐ
Guide Rail
Claw
Claw

Fig. 2-5-21

2.5.15 Stator Assembly

(1) Take out 2 screws (A).
(2) Raise the stator assembly in the direction indicated by the arrow to remove it.
(3) Remove the flat cable.
(4) To reinstall,first secure the flat cable,then insert 2 screws (A).
(5) After reinstalling, be sure to perform PB switching point adjustment(See SECTION 3 ELECTRICAL ADJUSTMENT).

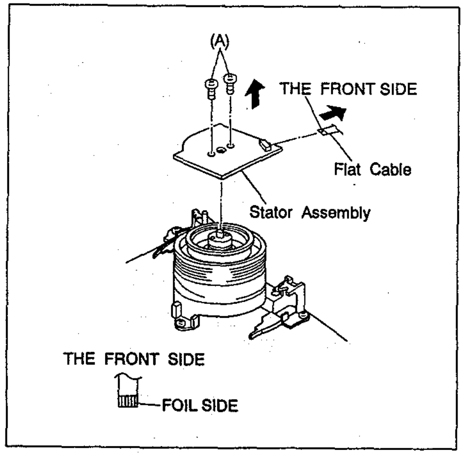

(A)
THE FRONT SIDE
Flat Cable
Stator Assembly
THE FRONT SIDE
FOIL SIDE

Fig. 2-5-22

NOTE : *When refitting the connector, check that the flat wire is inserted correctly.*

2.5.16 Rotor Assembly

(1) Remove the stator Assembly.
(2) Take out 2 screws (B) and remove the rotor Assembly.

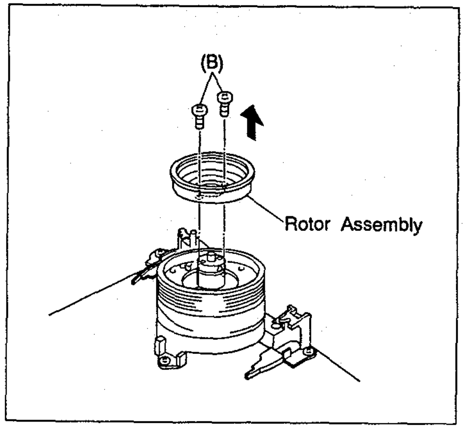

(B)
Rotor Assembly

Fig.2-5-23

(3) Align the upper drum assembly and rotor assembly phase as indicated in Fig.2-5-24.
(4) Overlap holes (a) of the upper drum assembly with holes (b) of the rotor assembly and secure with 2 screws (B) as indicated in Fig.2-5-23.

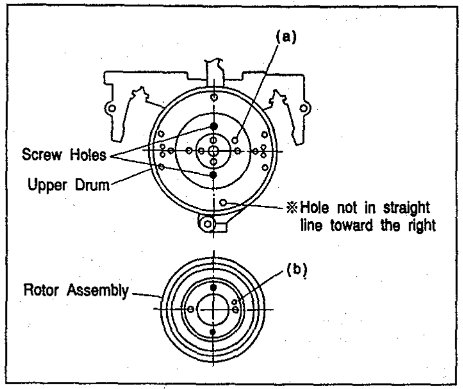

(a)
Screw Holes
Upper Drum
※Hole not in straight line toward the right
Rotor Assembly
(b)

Fig. 2-5-24

2.5.17 Upper Drum Assembly

1. Removal

(1) Remove the stator assembly and rotor assembly.
(2) Use a 1.5 mm hexagonal wrench to loosen the collar assembly screw and remove the collar assembly with brush, and remove the cap.
(3) Remove the upper drum assembly and use tweezers to remove the washer.

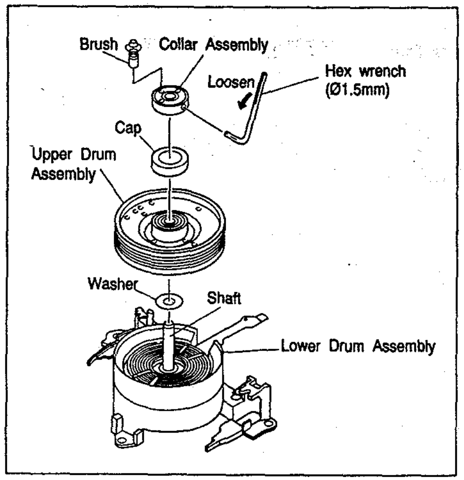

Brush
Collar Assembly
Loosen
Hex wrench (Ø1.5mm)
Cap
Upper Drum Assembly
Washer
Shaft
Lower Drum Assembly

Fig. 2-5-25

NOTE : *If the Brush is replaced, do not apply the grease to the contacts.*

2. Installation

(1) Use an air brush to clean the lower drum assembly and the coil section of the new upper drum assembly.
(2) Set a new washer on the drum shaft as indicated in Fig.2-5-25.

NOTE : *Be sure to use the new washer when replace the upper drum assembly.*

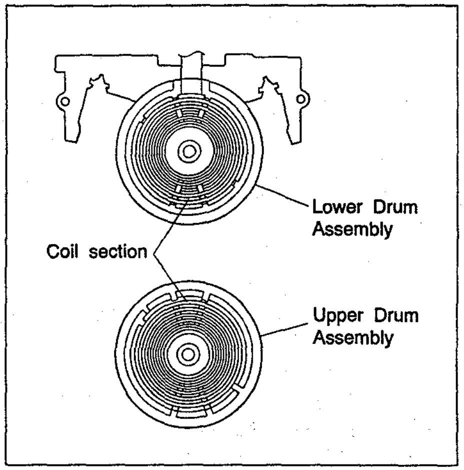

Lower Drum Assembly
Coil section
Upper Drum Assembly

Fig.2-5-26

(3) Note the top and bottom of the collar assembly and determine the position as indicated in Fig.2-5-27.

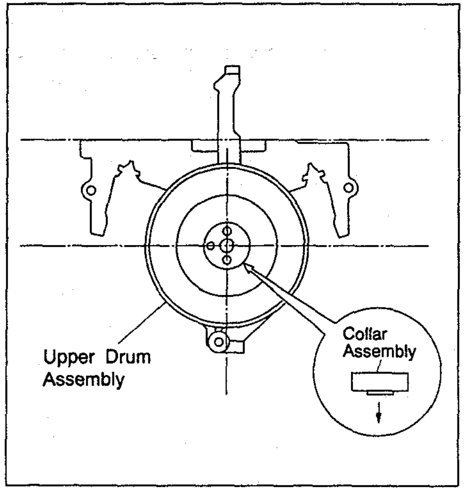

Upper Drum Assembly
Collar Assembly

Fig.2-5-27

(4) While pressing the collar assembly evenly from above with your fingertips,secure the hexagonal screw.

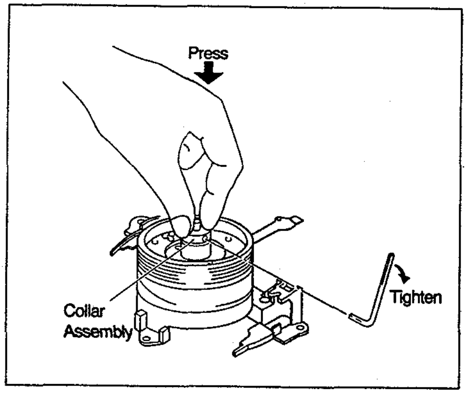

Press
Collar Assembly
Tighten

Fig.2-5-28

(5) After installing,gently turn the upper drum by hand and confirm normal rotation.
(6) Install the rotor assembly and stator assembly.
(7) Clean the upper and lower drum assemblies and perform the following adjustments;
- PB switching point adjustment
- Slow tracking preset adjustment
- Interchangeability adjustment

2.6 CHECKUP AND ADJUSTMENT OF MECHANISM PHASE

2.6.1 Precaution

The rotary encoder and syscon circuit are closely interrelated.Therefore,the rotary encoder and control cam conection determines the operations of mechanical parts such as plates,gears,brakes,etc.Correct positioning of these parts is essential for smooth tape loading and mechanical operations.

2.6.2 Loadidg Arm Assemby (supply,take-up)

(1) Install the supply loading arm assembly and the take-up loading arm assembly so that their positioning markings on the respective gear face each other and the holes of their arms correspond to the holes on the main deck assembly respectively.
(2) After setting the guide rails,engage the pole base assemblies with the tip of the loading arms respectively. Then,enter the mechanism into the unloading mode to return the pole base assemblies to the front position.
(3) Reassemble the peripheral parts of the guide rail to its original position.

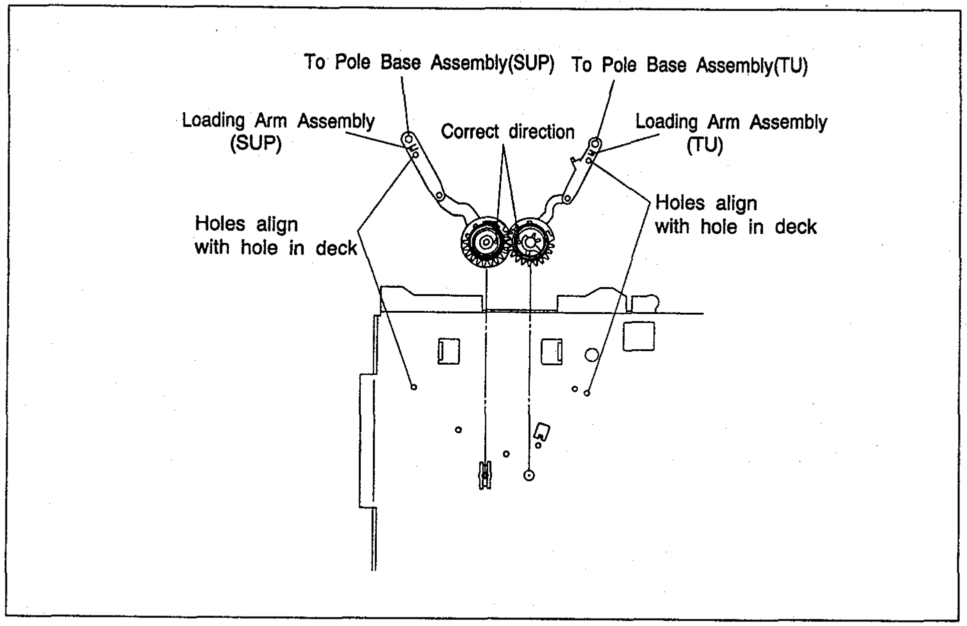

To Pole Base Assembly(SUP)
To Pole Base Assembly(TU)
Loading Arm Assembly (SUP)
Correct direction
Loading Arm Assembly (TU)
Holes align with hole in deck
Holes align with hole in deck

Fig. 2-6-1

2.6.3 Rotary Encoder,Change Lever,Control Cam

(1) When reinstalling the rotary encoder,adjust its position so as to fit the triangle marks each other and push it deep untill it is locked by the pawls.
(2) When reinstalling the change lever,set it so as to make its positioning hole correspond to the hole of the main deck assembly.
(3) When re-engaging the control cam,lower the capstan brake assembly while setting it so as to make its positioning hole correspond to the hole of the main deck assembly.

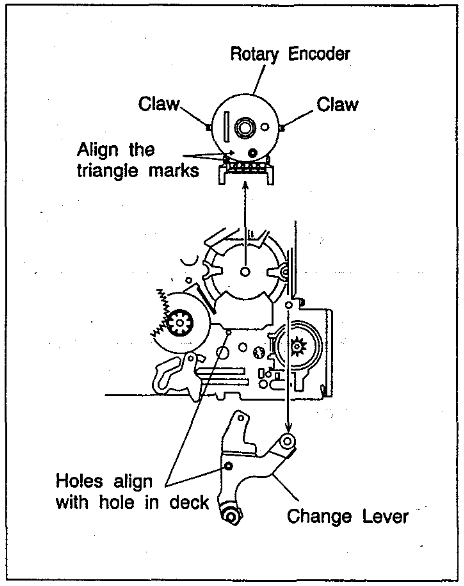

Rotary Encoder
Claw
Claw
Align the triangle marks
Holes align with hole in deck
Change Lever

Fig. 2-6-2

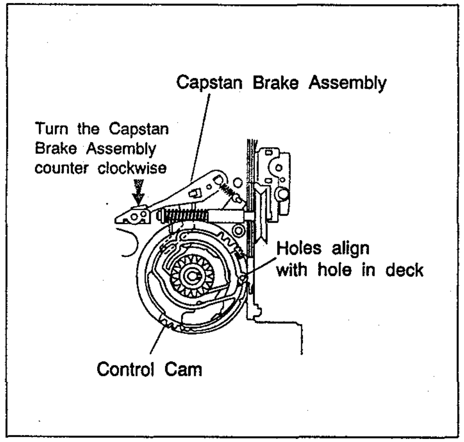

Capstan Brake Assembly
Turn the Capstan Brake Assembly counter clockwise
Holes align with hole in deck
Control Cam

Fig. 2-6-3

2.6.4 Slide Plate

(1) Lower both the main brake assemblies (supply and take-up) untill they touch the edge of the main deck assembly while reinstalling the slide plate so as to make the respective positioning holes of the main brake assemblies correspond to the holes on the main deck assembly.

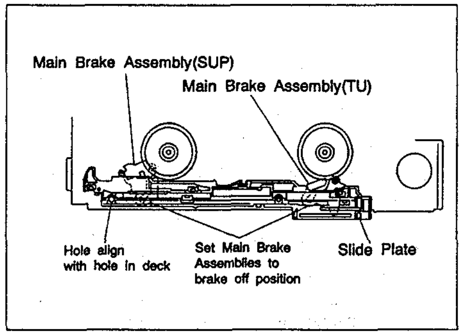

Main Brake Assembly(SUP)
Main Brake Assembly(TU)
Hole align with hole in deck
Set Main Brake Assemblies to brake off position
Slide Plate

Fig.2-6-4

2.6.5 Control Plate

(1) Reinstall the control plate so as to set the two positioning holes of it on the holes on the main deck assembly respectively and to set the positioning hole of the take-up lever on the hole of the main deck at the same time. When adjusting the hole position of the take-up lever,use a pair of tweezers to hold and move it since it is pulled by a tension spring.
(2) After reinstalling the control plate,fix it with the slit washer,control bracket-1 and -2.

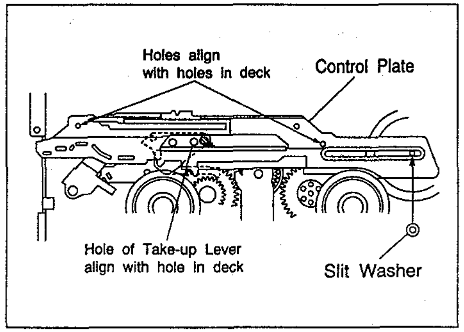

Holes align with holes in deck
Control Plate
Hole of Take-up Lever align with hole in deck
Slit Washer

Fig. 2-6-5

2.7 TAPE INTERCHANGEABILITY ADJUSTMENT

NOTE :
- *This adjustment is extremely important. However, it is normally not required during routine service. Perform only after replacing major components(A/C head,upper/lower drum assembly,pole base assembly,etc).*
- *Before using costly alignment tape,use a spare tape and confirm correct operation of the tape transport.*

2.7.1 Tape pattern

(1) Connect the oscilloscope to TP106(PB FM) on the Main board. Use TP111(D.FF) on the Main board as a trigger.

(2) Playback the SP stairstep portion of the alignment tape [MHPE]. Confirm that the FM waveform appears as indicated in Fig.2-7-1.

(3) Set the manual tracking position by pressing the **////** button on the remote controller or TV PROG "-" and "+" buttons simultaneously.

(4) Operate the tracking adjustment (press the TV PROG buttons during playback) and set for maximum playback FM waveform.

(5) By operating the TV PROG button, vary the FM waveform from maximum to minimum and vice versa to confirm that the waveform varies nearly in a flat shape as shown in Fig.2-7-1.

(6) When the FM waveform does not remain flat during this process, first slightly loosen the set screw located at the bottom of the guide rollers. Using the guide roller adjustment tool (Roller driver), adjust the supply and take-up guide rollers (refer to Fig.2-7-2) to obtain the correct waveform as indicated in Fig.2-7-3.

(7) By pressing the TV PROG buttons several times, vary the FM waveform output from maximum to minimum (and vice versa) gradually, and confirm that the variation proceeds in flat shape, as shown in Fig.2-7-3.

(8) Record the signal and play it back of the SP confirm that the FM waveform is flat in both mode.

(9) After adjustments, tighten the set screw of the guide rollers.

(10) Confirm that the tape wrinking does not occur at the roller upper or lower limits as indicated in Fig.2-7-4.

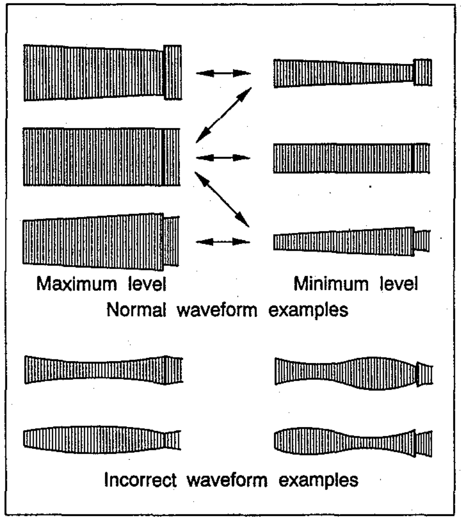

Maximum level
Minimum level
Normal waveform examples
Incorrect waveform examples

Fig. 2-7-1

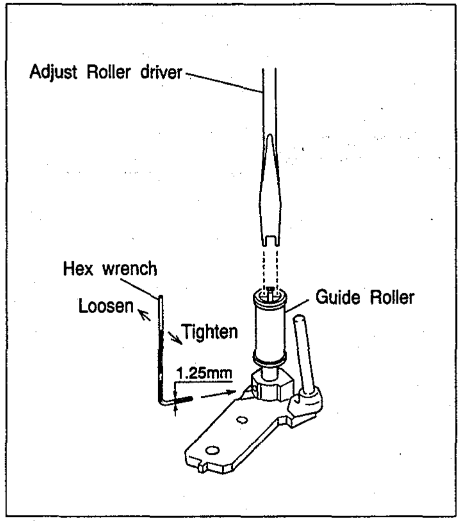

Adjust Roller driver
Hex wrench
Loosen
Tighten
1.25mm
Guide Roller

Fig. 2-7-2

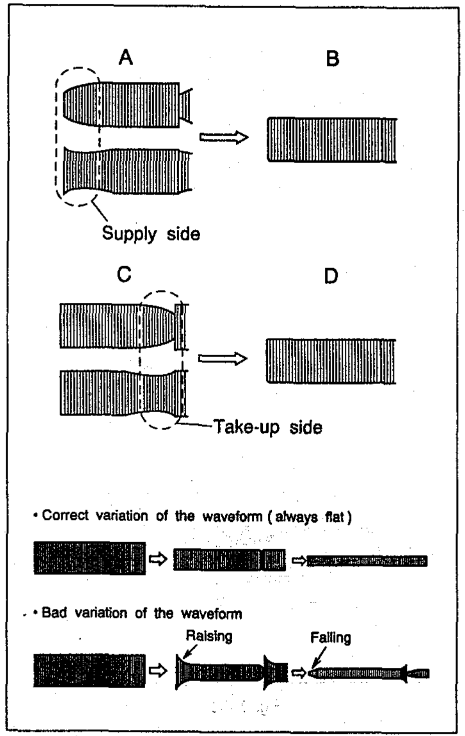

A
B
Supply side
C
D
Take-up side
• Correct variation of the waveform (always flat)
• Bad variation of the waveform
Raising
Falling

Fig. 2-7-3

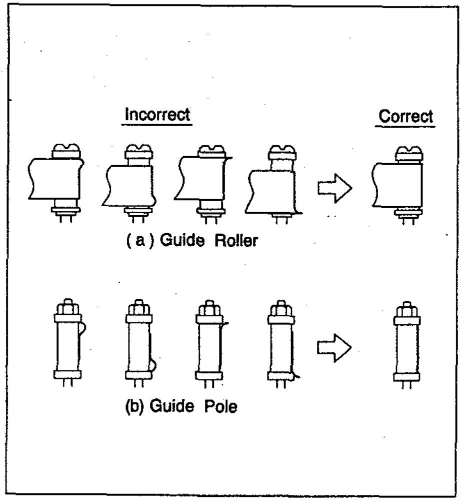

Incorrect
Correct
(a) Guide Roller
(b) Guide Pole

Fig. 2-7-4

2.7.2 A/C head height & azimuth

NOTE :
- *Temporarily set A/C head height as indicated in Fig. 2-5-4.*
- *Use spare tape to check the transport and confirm the tape is not scratched or damaged.*

1. Tilt

(1) Use spare tape and set for playback.

(2) Turn screw (3) clockwise to where the tape curls just slightly at the TU guide pole bottom flange as shown in Fig.2-7-5.

(3) Then slowly turn screw (3) counterclockwise to where the curling ceases.

2. Height

(1) Connect CH-1 of a dual trace oscilloscope to Audio Out.

(2) Connect CH-2 to TP1101(CTL PULSE) of the Main board assembly and use the ALT mode.

(3) Playback the SP stairstep portion of the alignment tape [MHPE].

(4) Adjust screws (1),(2) and (3) for maximum audio output and control pulse level.

3. Azimuth

(1) Connect the oscilloscope to Audio Out.

(2) Playback the SP stairstep portion of the alignment tape [MHPE].

(3) Adjust screw (2) so that the audio output is both maximum and with minimum fluctuation.

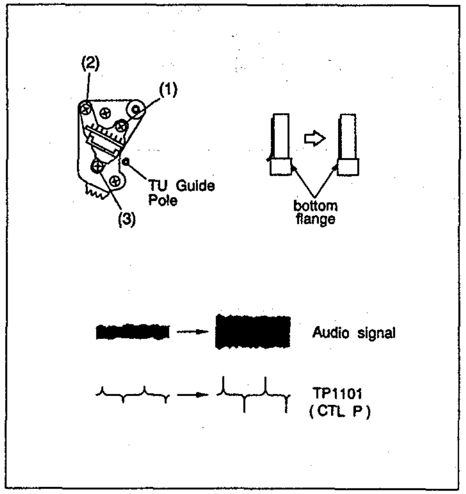

(2)
(1)
TU Guide Pole
(3)
bottom flange
Audio signal
TP1101 (CTL P)

Fig. 2-7-5

2.7.3 A/C head phase(X-value)

(1) Connect the oscilloscope to TP106(PB FM) on the MAIN board.Use TP111(D.FF) on the MAIN board as a trigger.
(2) Playback the SP stairstep portion of the alignment tape [MHPE].
(3) Set the neutral manual tracking position by pressing the **///** button on the remote controller or TV PROG "-" and "+" buttons simultaneously.
(4) If adjustment is required,slightly loosen screws (4) and (5). Set A/C head positioning tool on the A/C head adjusting boss as indicated in Fig.2-7-6.
(5) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig.2-7-7.
(6) Tighten screw (5). Remove the tool and tighten screw (4).

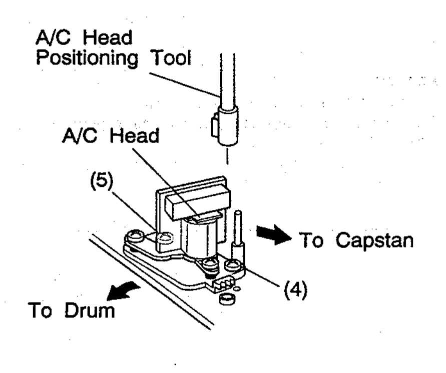

A/C Head Positioning Tool
A/C Head
(5)
To Capstan
(4)
To Drum

Fig. 2-7-6

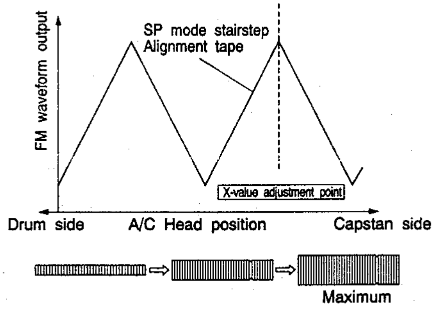


Fig. 2-7-7

2.7.4 Tension pole position

(1) Set for playback mode using MECHANISM SERVICE MODE(See SECTION 1 DISASSEMBLY).
(2) Turn the adjust pin so that the tension arm assembly does not touch ϕ2.5 pole on the outside.
(3) After adjustment,use the back tension cassette gauge and set for the playback mode.
(4) Confirm reading of 29 to 46 g-cm.

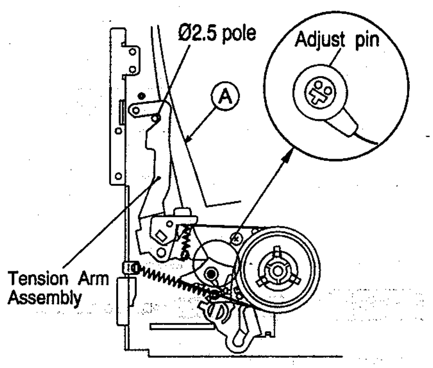

Ø2.5 pole
Adjust pin
A
Tension Arm Assembly

Fig. 2-7-8

SECTION 3
ELECTRICAL ADJUSTMENT

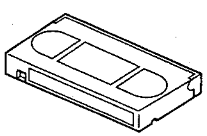
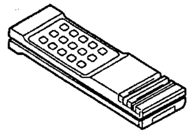
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/maker
⑥ Signal generator: PAL colour bar, stairstep
⑦ Recording tape
⑧ Numeric remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU940008
	

3.1.3 Colour bar signal,colour bar pattern

- Colour bar signal

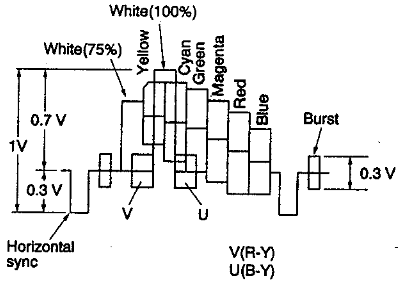

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1V
0.3 V
0.3 V
V
U
Horizontal sync
V(R-Y)
U(B-Y)

Fig.3-1-1 Colour bar signal waveform

- Colour bar pattern

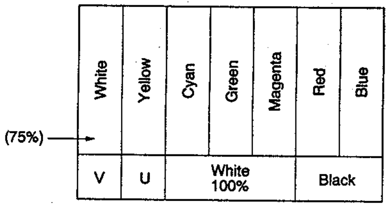

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
V
U
White 100%
Black

Fig.3-1-2 Colour bar pattern

3.2 SERVO CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *Set VCR to the mode A by remote controller.*
- *Use only buttons "O", depressing other buttons during adjustment may cause adjustment errors.*

3.2.1 PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB
Equipment	• Oscilloscope
Measurement point	• J1401- pin 19 (VIDEO OUT)
Trigger slope (-)	• TP111(DRUM FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

(1) Connect an oscilloscope to J1401- pin 19 (VIDEO OUT) and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
(4) The adjustment is performed automatically.
Once the adjustment is performed, the VCR will go into the STOP mode.

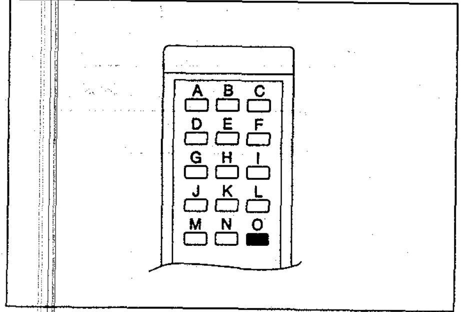


Fig.3-2-1 Presetting unit

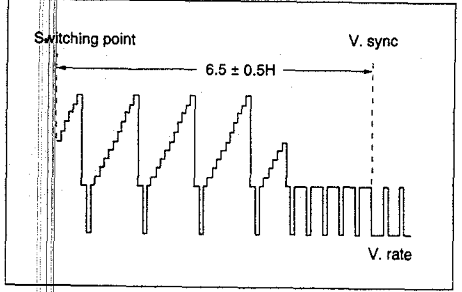


Fig.3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Tuner or colour bar
Mode	• LP, REC → PB(SLOW)
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : *Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.*

(1) Record a colour bar signal in the LP mode.
(2) Playback recorded signal on the FWD slow mode.
(3) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B " or "C " buttons of the presetting unit.
(4) Depress the STOP button.
(5) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(6) Repeat steps (2) to (5) in the REV slow mode.

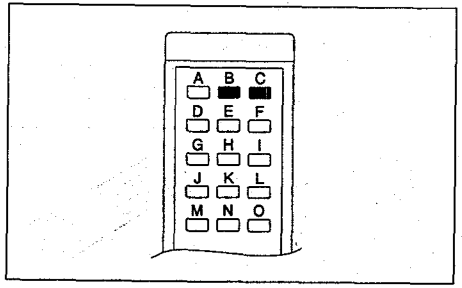


Fig.3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *Set VCR to the mode A by remote controller.*

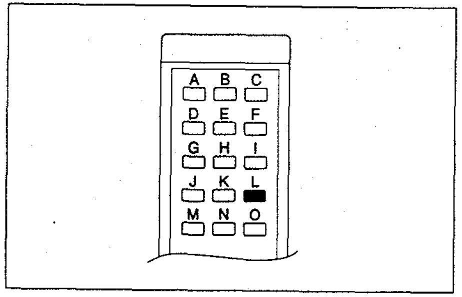


Fig.3-3-1 Presetting unit

3.3.1 Auto picture

Signal	• Monoscope
Mode	• BEST : OFF • REC then PB • SP/LP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

(1) Set the B.E.S.T feature to OFF or MENU screen.
(2) Record a monoscope signal in the SP mode.
(3) Playback the recorded signal.
(4) Press the "L" button of the presetting unit during playback.
(5) Confirm that VCR will go into the STOP mode.
(6) Repeat steps (2) to (5) in the LP mode.

3.4 SYSCON CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *When perform this adjustment,remove the MECHANISM assembly.*

3.4.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• TP702 round(SYS.CLK)
Adjustment part	• C701 (TIMER CLOCK)
Specification	• 1024.008 ± 0.001 Hz [976.5549 ± 0.0010 usec]

(1) Connect the frequency counter to TP702 round and GND.
(2) Connect the short wire between TP701 round and Vcc(5V).
(3) Short the leads of capacitor C704 once in order to reset IC701.
(4) Disconnect the short wire then connect it again quickly.
(5) Adjust C701 for 1024.008 ± 0.001 Hz.
(976.5549 ± 0.0010 usec)

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufactures recommended parts.

1. Units of components on the schematic diagram

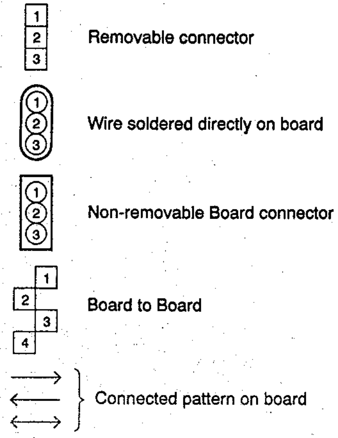
Unless otherwise specified.

1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
Chip resistors are 1/16 W.
K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or IN4148M (refer to parts list).

2. Indications of control voltage

AUX : Active only at high
$\overline{\text{AUX}}$ or AUX(L) : Active at low

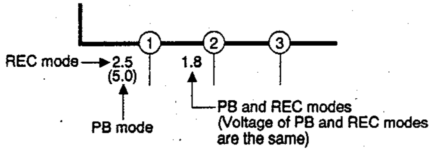
3. Interpreting Connector Indications


1
2
3
Removable connector
1
2
3
Wire soldered directly on board
1
2
3
Non-removable Board connector
1
2
3
4
Board to Board
Connected pattern on board

4. Voltage measurement

1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
— : Unmeasurable or unnecessary to measure
2) Audio circuits
REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
PB : REC then playback it
3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode

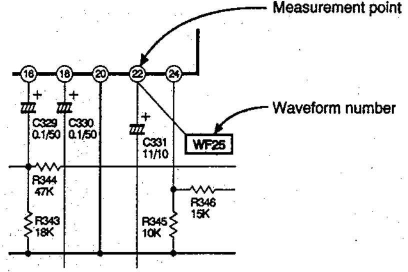
4) Indication on schematic diagram
Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


1
2
3
REC mode
2.5
(5.0)
1.8
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

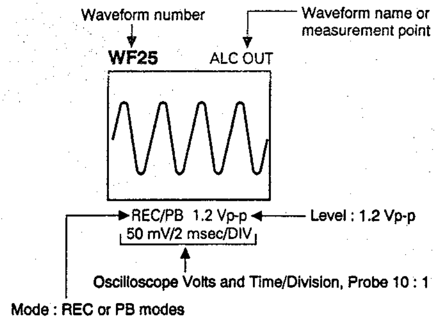
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
REC : Colour bar signal in SP mode, normal VHS mode
PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
PB : REC then playback it
3) Movie Camera circuits
Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
Waveform Indications on the schematic diagram are as shown below.

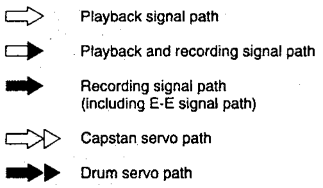

Measurement point
16
18
20
22
24
Waveform number
C329
0.1/50
C330
0.1/50
C331
11/10
WF25
R344
47K
R346
15K
R343
18K
R345
10K

5) Waveform indications

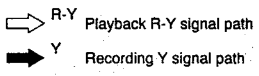

Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
Level : 1.2 Vp-p
50 mV/2 msec/DIV
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

6. Signal path Symbols

The arrows indicate the signal path as follows.

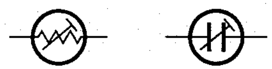

Playback signal path
Playback and recording signal path
Recording signal path
(including E-E signal path)
Capstan servo path
Drum servo path

(Example)


R-Y
Playback R-Y signal path
Y
Recording Y signal path

7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.



8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

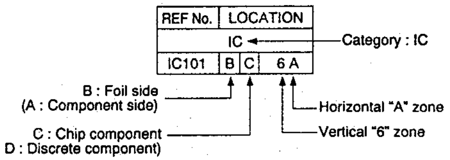
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

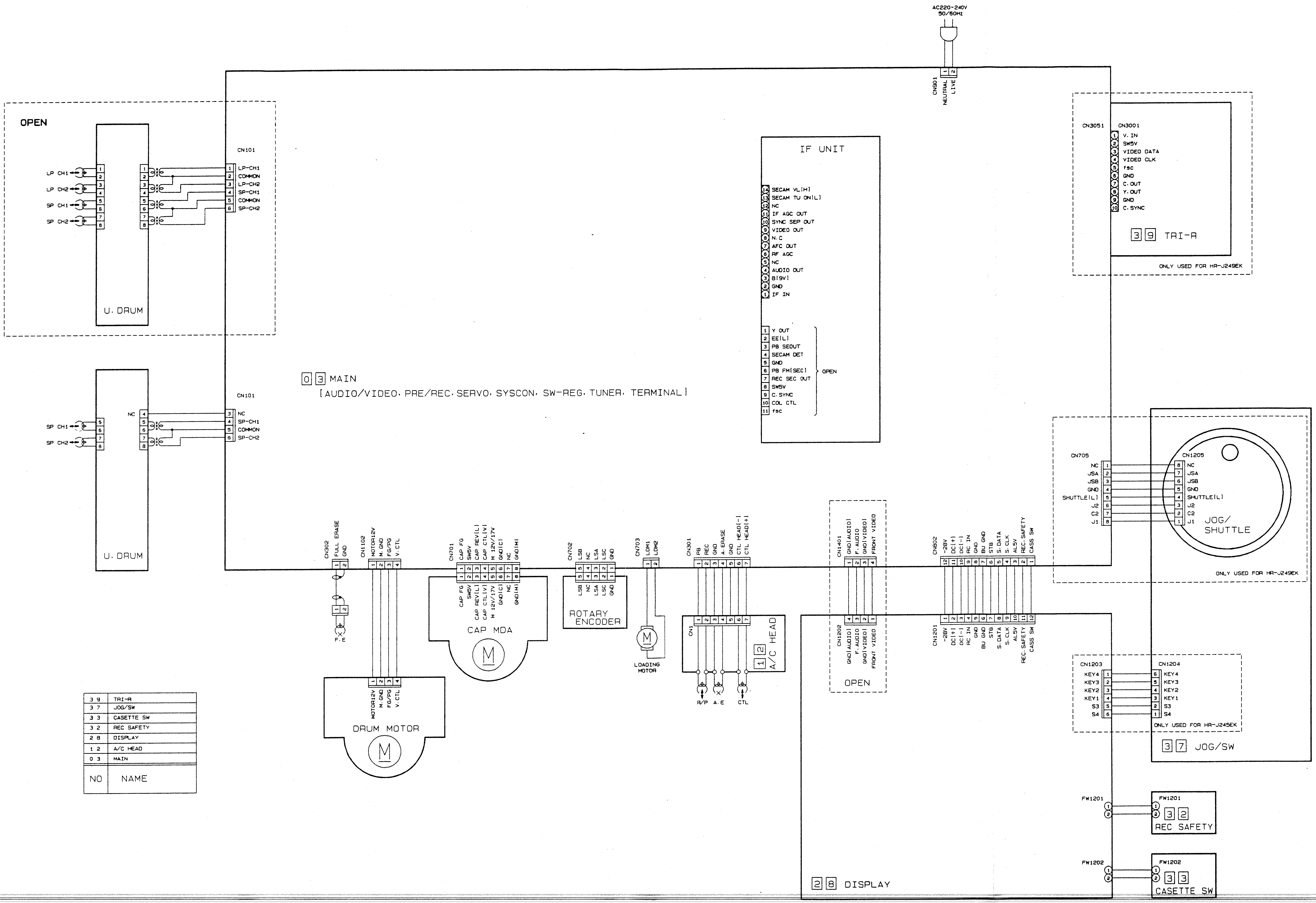
2. Parts location guides

Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category : IC
IC101
B
C
6 A
B : Foil side
(A : Component side)
C : Chip component
D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

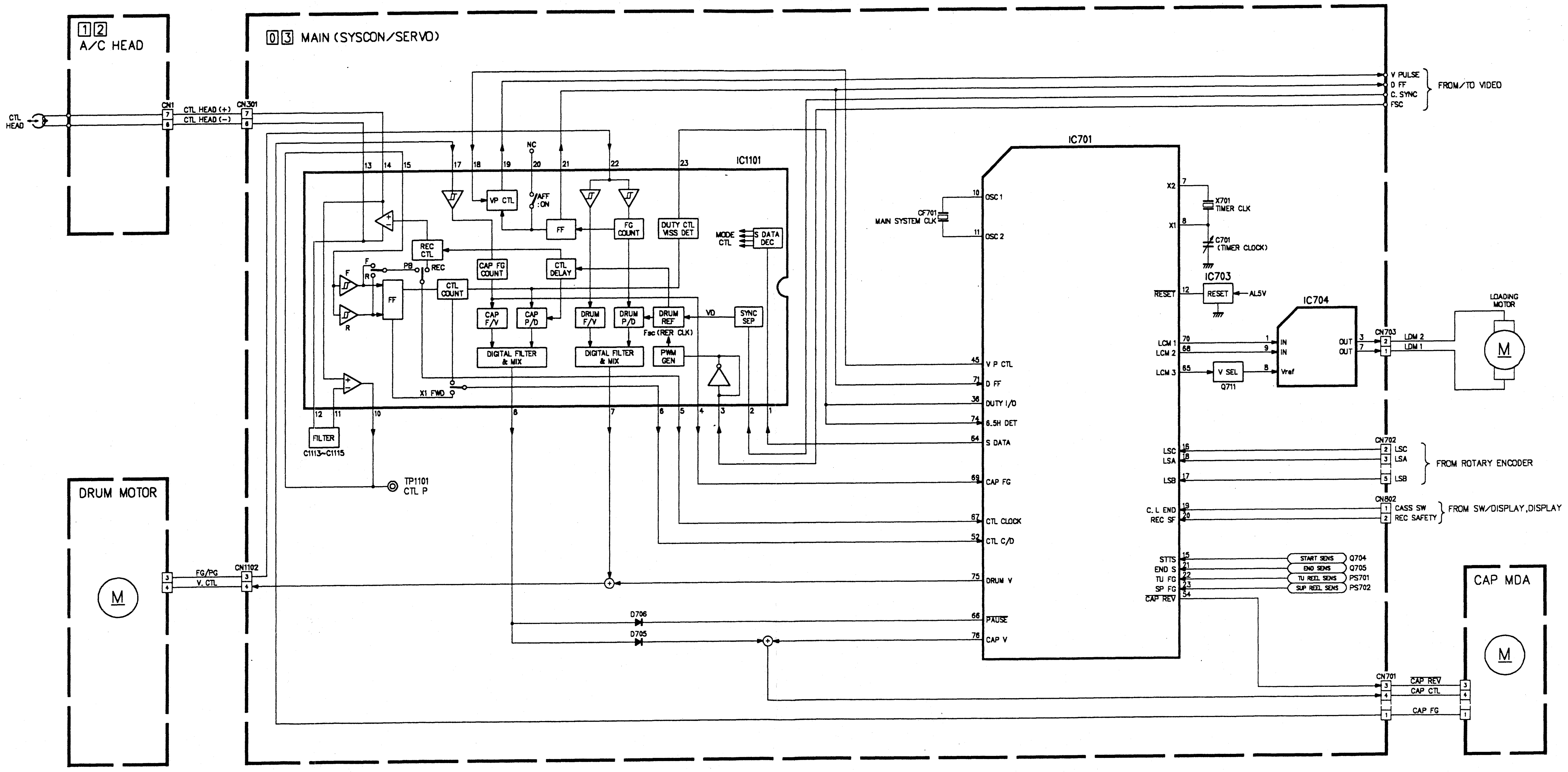
Note:
For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS


AC220-240V 50/60Hz
CN901
NEUTRAL
LIVE
OPEN
LP CH1
LP CH2
SP CH1
SP CH2
U. DRUM
CN101
LP-CH1
COMMON
LP-CH2
SP-CH1
COMMON
SP-CH2
NC
IF UNIT
SECAM VL[H]
SECAM TU ON[L]
NC
IF AGC OUT
SYNC SEP OUT
VIDEO OUT
N.C
AFC OUT
RF AGC
NC
AUDIO OUT
B[9V]
GND
IF IN
Y OUT
EE[L]
PB SEOUT
SECAM DET
GND
PB FM[SEC]
REC SEC OUT
SW5V
C. SYNC
COL CTL
fsc
OPEN
03 MAIN
[AUDIO/VIDEO· PRE/REC· SERVO· SYSCON· SW-REG· TUNER· TERMINAL]
CN3051
CN3001
V. IN
SW5V
VIDEO DATA
VIDEO CLK
fsc
GND
C. OUT
Y. OUT
GND
C. SYNC
39 TRI-A
ONLY USED FOR HR-J249EK
CN705
NC
JSA
JSB
GND
SHUTTLE[L]
J2
C2
J1
CN1205
JOG/ SHUTTLE
ONLY USED FOR HR-J249EK
CN302
FULL ERASE
GND
F.E
CN1102
MOTOR12V
M. GND
FG/PG
V. CTL
DRUM MOTOR
CN701
CAP FG
SW5V
CAP REV[L]
CAP CTL[V]
M 12V/17V
GND[C]
NC
GND[M]
CAP MDA
CN702
LSB
NC
LSA
LSC
GND
ROTARY ENCODER
CN703
LDM1
LDM2
LOADING MOTOR
CN301
PB
REC
GND
A. ERASE
GND
CTL HEAD[-]
CTL HEAD[+]
CN1
12 A/C HEAD
R/P
A.E
CTL
CN1401
GND[AUDIO]
F. AUDIO
GND[VIDEO]
FRONT VIDEO
CN1202
OPEN
CN802
-28V
DC[+]
DC[-]
RC IN
GND
BU GND
STB
S. DATA
S. CLK
AL5V
REC. SAFETY
CASS SW
CN1201
CN1203
KEY4
KEY3
KEY2
KEY1
S3
S4
CN1204
ONLY USED FOR HR-J245EK
37 JOG/SW
FW1201
32 REC SAFETY
FW1202
33 CASETTE SW
28 DISPLAY

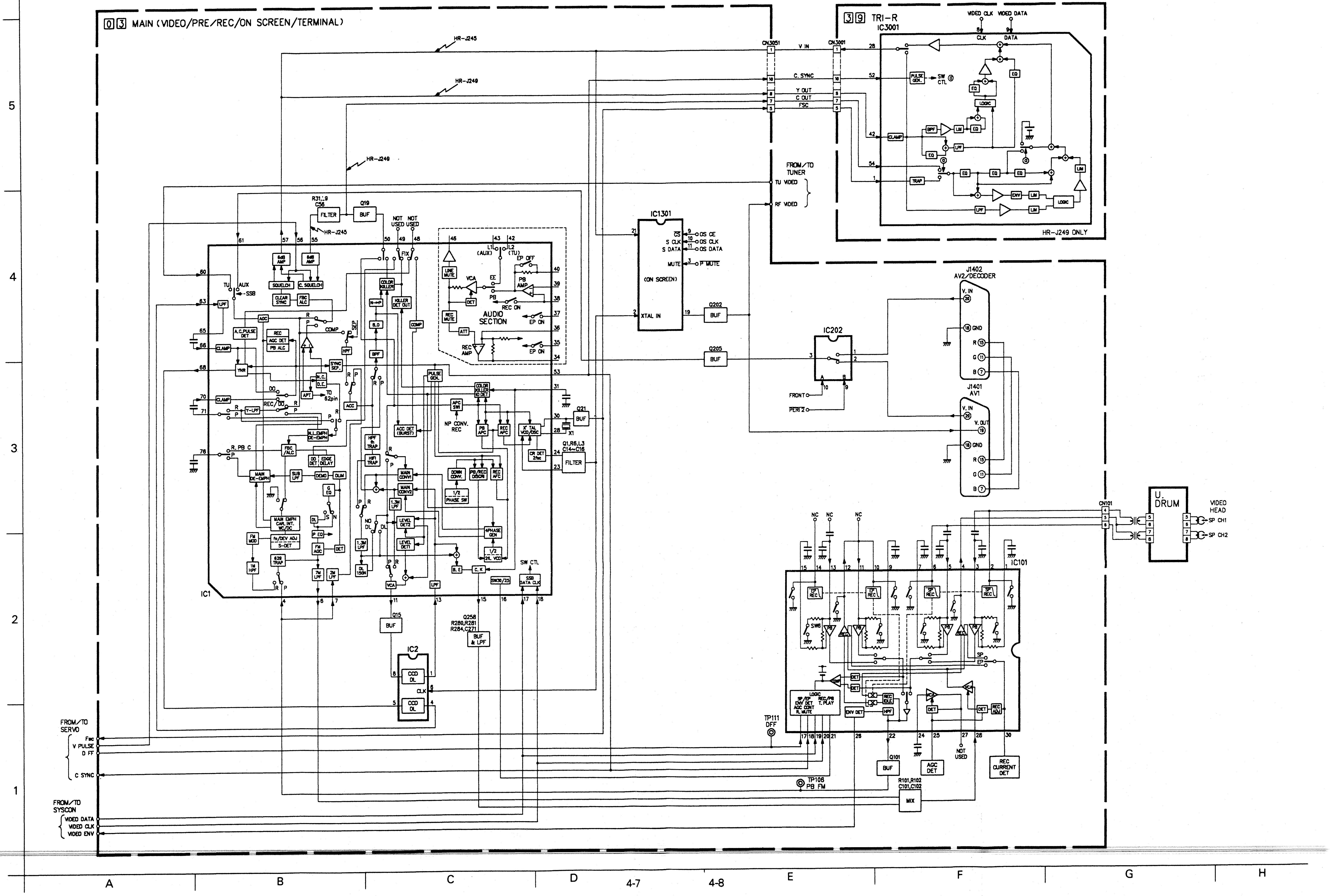
NO	NAME
39	TRI-A
37	JOG/SW
33	CASETTE SW
32	REC SAFETY
28	DISPLAY
12	A/C HEAD
03	MAIN

4.2 SYSTEM CONTROL BLOCK DIAGRAM



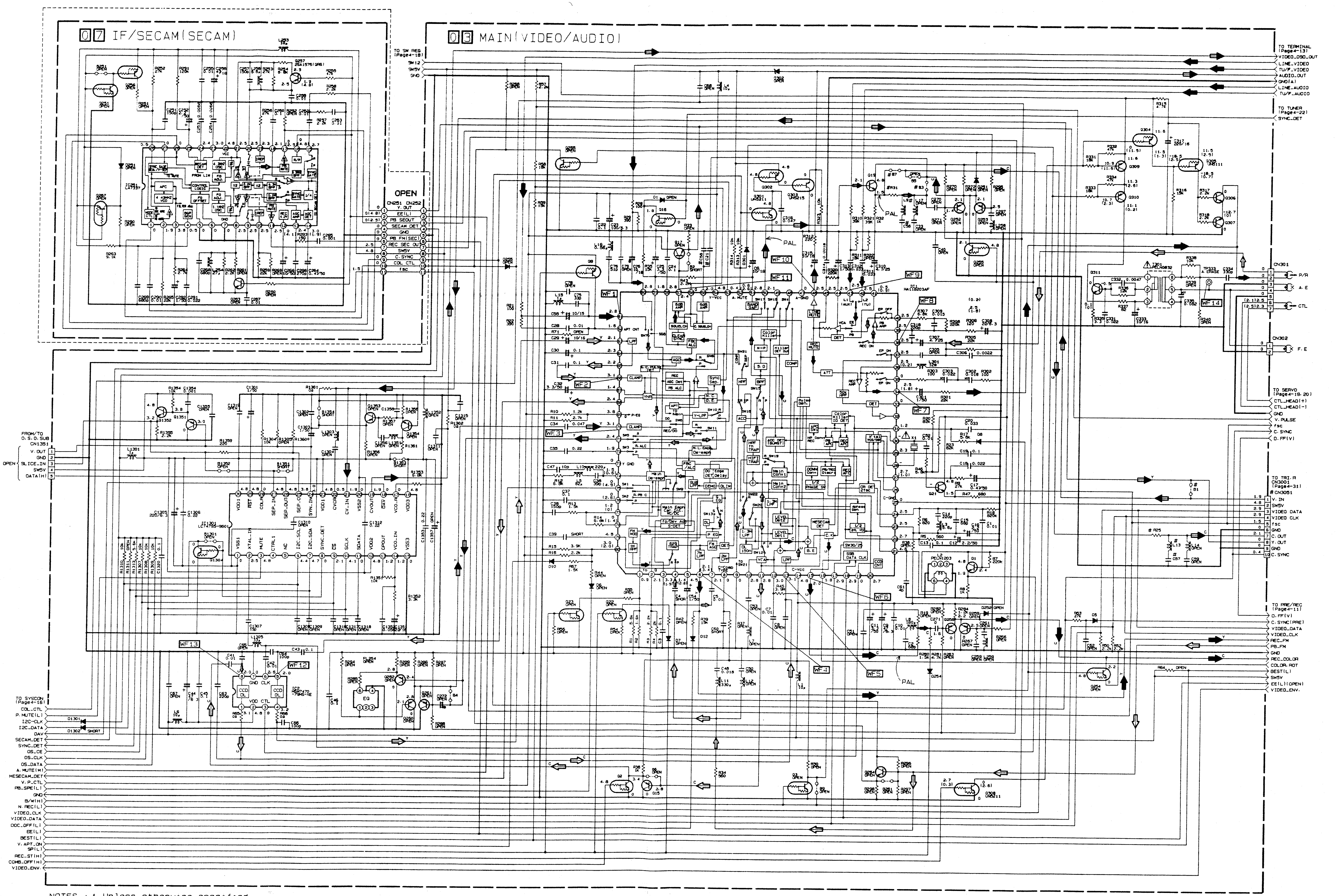
1 2 A/C HEAD
CTL HEAD
CN1
CTL HEAD (+)
CTL HEAD (−)
CN301
0 3 MAIN (SYSCON/SERVO)
IC1101
NC
AFF :ON
VP CTL
FF
FG COUNT
DUTY CTL VISS DET
MODE CTL
S DATA DEC
REC CTL
CAP FG COUNT
CTL DELAY
PB
REC
F
R
CTL COUNT
CAP F/V
CAP P/D
DRUM F/V
DRUM P/D
DRUM REF
VD
SYNC SEP
Fsc (REF CLK)
DIGITAL FILTER & MIX
DIGITAL FILTER & MIX
PWM GEN
X1 FWD
FILTER
C1113~C1115
TP1101 CTL P
DRUM MOTOR
M
FG/PG
V. CTL
CN1102
D706
D705
IC701
CF701 MAIN SYSTEM CLK
OSC 1
OSC 2
V P CTL
D FF
DUTY I/O
6.5H DET
S DATA
CAP FG
CTL CLOCK
CTL C/D
DRUM V
PAUSE
CAP V
X2
X1
X701 TIMER CLK
C701 (TIMER CLOCK)
RESET
IC703
RESET
AL5V
IC704
LCM 1
LCM 2
LCM 3
IN
IN
Vref
OUT
OUT
V SEL
Q711
CN703
LDM 2
LDM 1
LOADING MOTOR
M
V PULSE
D FF
C. SYNC
FSC
FROM/TO VIDEO
LSC
LSA
LSB
CN702
FROM ROTARY ENCODER
C. L END
REC SF
CN802
CASS SW
REC SAFETY
FROM SW/DISPLAY,DISPLAY
STTS
END S
TU FG
SP FG
CAP REV
START SENS Q704
END SENS Q705
TU REEL SENS PS701
SUP REEL SENS PS702
CAP MDA
M
CN701
CAP REV
CAP CTL
CAP FG

4.3 VIDEO BLOCK DIAGRAM



03 MAIN (VIDEO/PRE/REC/ON SCREEN/TERMINAL)
39 TRI-R
IC3001
VIDEO CLK
VIDEO DATA
CLK
DATA
CN3051
CN3001
V IN
C. SYNC
Y OUT
C OUT
FSC
PULSE GEN.
SW CTL
CLAMP
TRAP
BPF
LIM
EQ
LOGIC
LPF
ENV
HR-J249 ONLY
HR-J245
HR-J249
FROM/TO TUNER
TU VIDEO
RF VIDEO
IC1301
CS
S CLK
S DATA
MUTE
OS CE
OS CLK
OS DATA
P MUTE
(ON SCREEN)
XTAL IN
Q202
BUF
Q205
IC202
FRONT
PERI 2
J1402
AV2/DECODER
J1401
AV1
V. IN
V. OUT
GND
R
G
B
R31,L9
C56
FILTER
Q19
NOT USED
FIX
6dB AMP
SQUELCH
C. SQUELCH
CLEAR SYNC
FBC ALC
AGC
A.C.PULSE DET
REC AGC DET
PB ALC
CLAMP
YNR
COMP
SEP
HPF
SYNC SEP.
N.C.
D.C.
APT
TO 62pin
Y-LPF
REC/DD
N.L.EMPH DE-EMPH
FBC /ALC
DO DET
EDGE DELAY
MAIN DE-EMPH
SUB LPF
DEMO
DLIM
G EQ
MAIN EMPH CAR. INT. WC/DC
fo/DEV ADJ
S-DET
FM MOD
1M HPF
628 TRAP
FM AGC
DET
P EQ
DL
7M LPF
2M LPF
COLOR KILLER
N→P
KILLER DET OUT
B.D
BPF
ACC
HPF fH TRAP
HIFI TRAP
MAIN CONV1
MAIN CONV2
1.3M LPF
DL 150N
LEVEL DET2
LEVEL DET1
VCA
LPF
PULSE GEN.
ACC DET (BURST)
APC SW1
NP CONV. REC
COLOR KILLER ID DET
PB APC
REC APC
X' TAL VCO/OSC
CR DET 2fsc
DOWN CONV.
PB/REC DISCRI
REC AFC
1/2 PHASE SW
4PHASE GEN
1/2 2fL VCO
B. E
C. K
SW30/25
SSB DATA CLK
SW CTL
LINE MUTE
VCA
EE
PB
EP OFF
PB AMP
REC ON
EP ON
REC MUTE
ATT
REC AMP
AUDIO SECTION
(AUX)
(TU)
TU
AUX
SSB
IC1
Q21
X1
Q1,R6,L3
C14~C16
Q15
IC2
CCD DL
CLK
Q258
R280,R281
R284,C271
BUF & LPF
FROM/TO SERVO
Fsc
V PULSE
D FF
C SYNC
FROM/TO SYSCON
VIDEO DATA
VIDEO CLK
VIDEO ENV
TP111 DFF
TP106 PB FM
IC101
NC
EP REC
SP REC
SW6
PB
REC
SP
EP
LOGIC
SP/EP ENV DET AGC CONT RL MUTE
REC/PB T. PLAY
ENV DET
HPF
REC IDLE
VCA
REC ADJ
Q101
BUF
AGC DET
NOT USED
REC CURRENT DET
R101,R102
C101,C102
MIX
CN101
U. DRUM
VIDEO HEAD
SP CH1
SP CH2
A
B
C
D
E
F
G
H
1
2
3
4
5
6

4.4 VIDEO AND N.AUDIO SCHEMATIC DIAGRAM

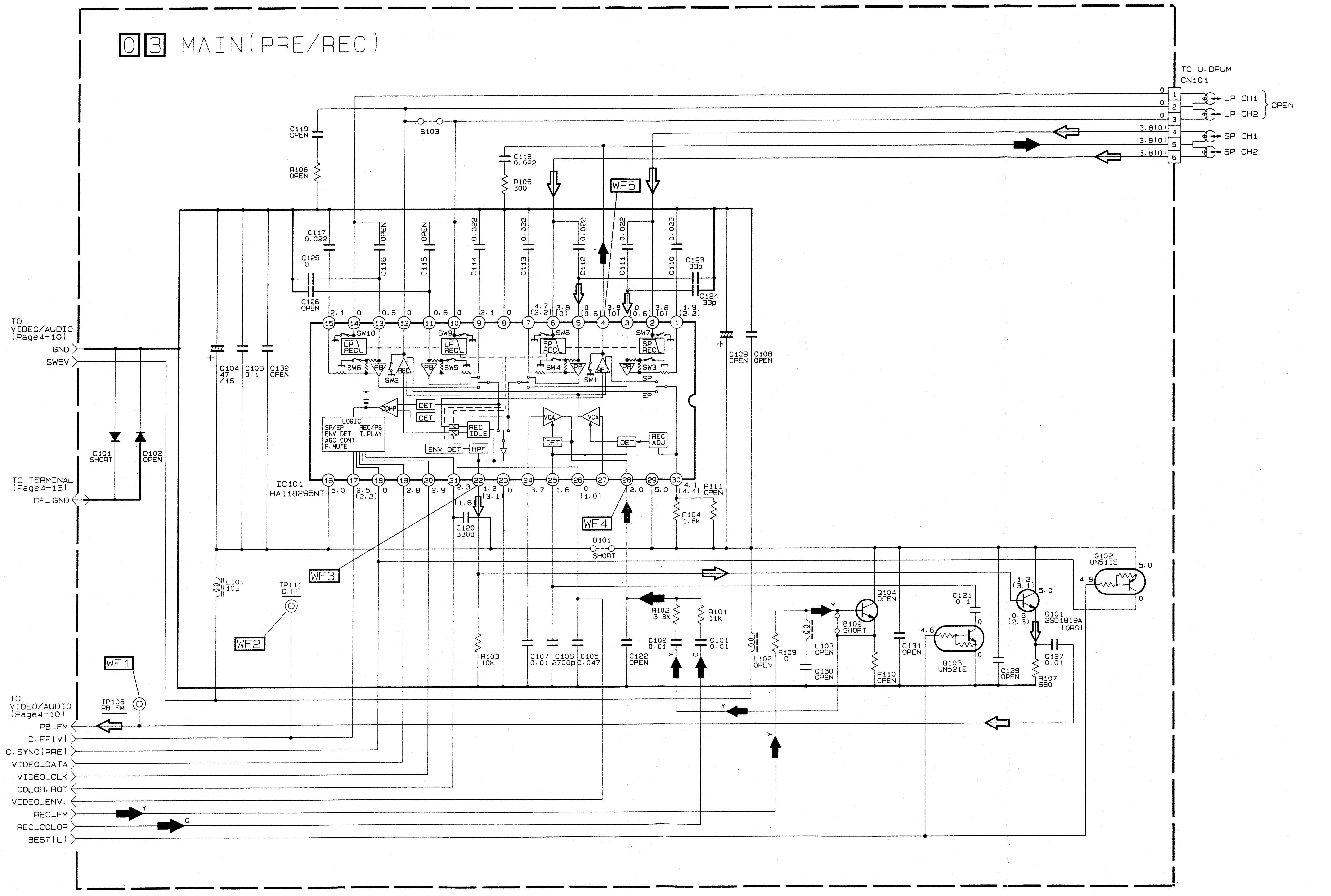

07 IF/SECAM(SECAM)
03 MAIN(VIDEO/AUDIO)
OPEN
TO SW REG (Page4-18)
TO TERMINAL (Page4-13)
TO TUNER (Page4-22)
TO SERVO (Page4-19,20)
TO TRI-R CN3001 (Page4-31)
TO PRE/REC (Page4-11)
FROM/TO O.S.D.SUB CN1351
TO SYSCON (Page4-16)
CN301
CN302
PAL

NOTES : 1. Unless otherwise specified.
All PNP type transistors are 2SB1218A(QR). All PNP type digital transistors are UN511E.
All NPN type transistors are 2SD1819A(QRS). All NPN type digital transistors are UN521E.
2. For VIDEO/AUDIO waveforms, please refer to page4-23.

3. COMPARISON CHART OF MODELS & MARKS(#).

	REF. No	R25	R31	C21	C56	C57	C58	L9	L13	B1	B3	B7	CN3051
MODELS	HR-J245EK	OPEN	560	0.01	8P	OPEN	OPEN	82μ	OPEN	SHORT	SHORT	OPEN	NOT USED
	HR-J249EK	560	OPEN	OPEN	OPEN	8P	0.01	OPEN	82μ	OPEN	OPEN	SHORT	USED

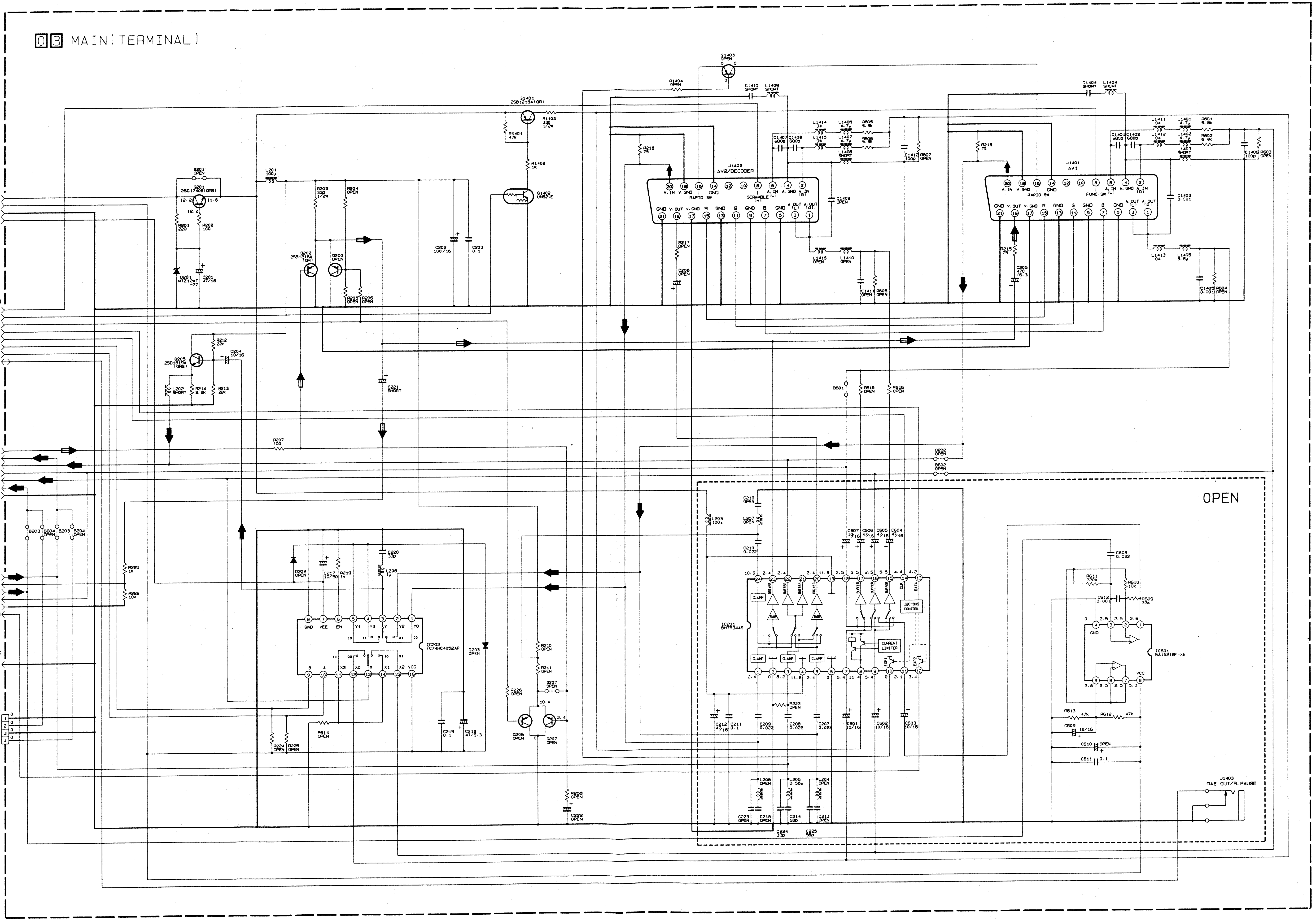
4.5 PRE/REC SCHEMATIC DIAGRAM



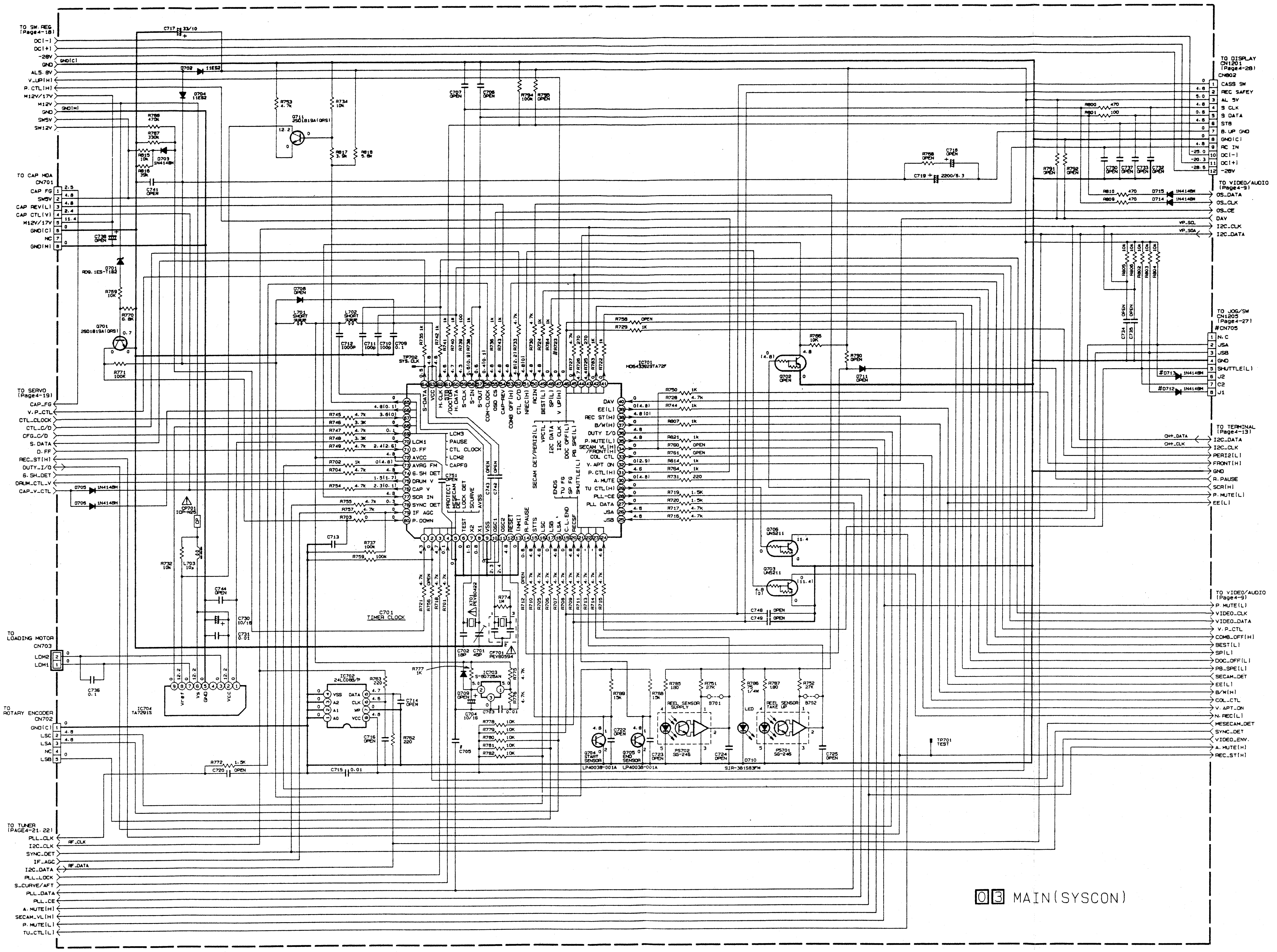
03 MAIN(PRE/REC)
TO U.DRUM
CN101
LP CH1
LP CH2
OPEN
SP CH1
SP CH2
3.8(0)
C119 OPEN
R106 OPEN
B103
C118 0.022
R105 300
WF5
C117 0.022
C125 0
C126 OPEN
C116 OPEN
C115 OPEN
C114 0.022
C113 0.022
C112 0.022
C111 0.022
C110 0.022
C123 33p
C124 33p
SW10
SW9
SW8
SW7
SW6
SW5
SW4
SW3
SW2
SW1
LP REC
SP REC
PB
REC
SP
EP
COMP
DET
LOGIC
SP/EP REC/PB
ENV DET T.PLAY
AGC CONT
A.MUTE
REC IDLE
ENV DET
HPF
VCA
REC ADJ
IC101
HA118295NT
C109 OPEN
C108 OPEN
C104 47/16
C103 0.1
C132 OPEN
TO VIDEO/AUDIO (Page4-10)
GND
SW5V
D101 SHORT
D102 OPEN
TO TERMINAL (Page4-13)
RF_GND
R111 OPEN
R104 1.6k
C120 330p
WF4
WF3
B101 SHORT
L101 10μ
TP111 D.FF
WF2
WF1
TP106 PB FM
R103 10k
C107 0.01
C106 2700p
C105 0.047
R102 3.3k
R101 11k
C122 OPEN
C102 0.01
C101 0.01
L102 OPEN
R109 0
L103 OPEN
C130 OPEN
B102 SHORT
Q104 OPEN
R110 OPEN
C131 OPEN
C121 0.1
Q103 UN521E
C129 OPEN
Q101 2SD1819A (QRS)
Q102 UN511E
C127 0.01
R107 680
TO VIDEO/AUDIO (Page4-10)
PB_FM
D.FF(V)
C.SYNC(PRE)
VIDEO_DATA
VIDEO_CLK
COLOR.ROT
VIDEO_ENV.
REC_FM
REC_COLOR
BEST(L)
Y
C

NOTE : For PRE/REC waveforms, please refer to page4-23.

4.6 TERMINAL SCHEMATIC DIAGRAM


03 MAIN(TERMINAL)
TO SW REG (Page4-18)
AL12V
RF5V
GND
AUDIO(-)
TO SYSCON (Page4-16)
SCR(H)
EE(L)
P. MUTE(L)
I2C_DATA
I2C_CLK
PERI2(L)
FRONT(H)
R. PAUSE
TO VIDEO/AUDIO (Page4-10)
VIDEO_OSD_OUT
TU/F_VIDEO
LINE_VIDEO
AUDIO_OUT
LINE_AUDIO
TU/F_AUDIO
GND
B603
B604 OPEN
B203
B204 OPEN
TO TUNER (Page4-22)
TU_VIDEO
RF_VIDEO
TU_AUDIO
AUDIO_OUT
RF_GND
SECAM_TU_ON(L)
TO PRE/REC (Page4-11)
RF_GND
OPEN CN1401
AUDIO_GND
FRONT_AUDIO
GND(RF)
FRONT_VIDEO
B201 OPEN
Q201 2SC1740S(QRS)
12.2
11.6
R201 220
R202 100
D201 MTZ12AT-77
C201 47/16
L201 100µ
R203 330 1/2W
R204 OPEN
Q202 2SB1218A (QR)
Q203 OPEN
R205 OPEN
R206 OPEN
C202 100/16
C203 0.1
Q205 2SD1819A (QRS)
R212 22k
C204 10/16
L202 SHORT
R214 2.2k
R213 22k
C221 SHORT
R207 100
Q1401 2SB1218A(QR)
R1401 47k
R1403 330 1/2W
R1402 1k
Q1402 UN521E
Q1403 OPEN
R1404 OPEN
C1410 SHORT
L1409 SHORT
R218 75
J1402 AV2/DECODER
V. IN
V. GND
RAPID SW
GND
SCRAMBLE (H)
A. IN (L)
A. GND
A. IN (R)
V. OUT
V. GND
R
G
B
A. OUT (L)
A. OUT (R)
L1414 0Ω
L1415 0Ω
L1406 4.7µ
L1407 4.7µ
L1408 SHORT
R605 5.6k
R606 5.6k
C1407 680p
C1408 680p
C1412 100p
R607 OPEN
C1409 OPEN
R217 OPEN
C206 OPEN
L1416 OPEN
L1410 OPEN
C1411 OPEN
R608 OPEN
C1404 SHORT
L1404 SHORT
R216 75
J1401 AV1
FUNC. SW
L1411 0Ω
L1412 0Ω
L1401 4.7µ
L1402 4.7µ
L1403 SHORT
R601 6.8k
R602 6.8k
C1401 680p
C1402 680p
C1406 100p
R603 OPEN
C1403 0.001
R215 75
C205 470/6.3
L1413 0Ω
L1405 5.6µ
C1405 0.001
R604 OPEN
B601
R615 OPEN
R616 OPEN
B202 OPEN
B602 OPEN
OPEN
R221 1k
R222 10k
D202 OPEN
C217 10/50
R219 1k
C220 33p
L208 1µ
IC202 TC74HC4052AP
GND
VEE
EN
Y1
Y3
Y
Y2
Y0
B
A
X3
X0
X
X1
X2
VCC
D203 OPEN
C219 0.1
C218 47/6.3
R614 OPEN
R224 OPEN
R225 OPEN
R210 OPEN
R211 OPEN
B207 OPEN
R226 OPEN
Q206 OPEN
Q207 OPEN
10.4
2.4
R208 OPEN
C222 OPEN
C216 OPEN
L203 100µ
L207 OPEN
C210 0.022
C607 10/16
C606 47/16
C605 47/16
C604 47/16
IC201 BH7634AS
CLAMP
DRIVER
BUFFER
6dB
CLK
DATA
I2C-BUS CONTROL
CURRENT LIMITER
EXP1
EXP2
C212 47/16
C211 0.1
C209 0.022
R223 OPEN
C208 0.022
C207 0.022
C601 10/16
C602 10/16
C603 10/16
L206 OPEN
L205 0.56µ
L204 OPEN
C223 OPEN
C215 OPEN
C214 68p
C213 OPEN
C224 33p
C225 56p
C608 0.022
R611 220k
R610 10k
C612 0.001
R609 33k
IC601 BA15218F-XE
GND
VCC
R613 47k
R612 47k
C609 10/16
C610 OPEN
C611 0.1
J1403 RAE OUT/R. PAUSE

4.7 SYSCON SCHEMATIC DIAGRAM

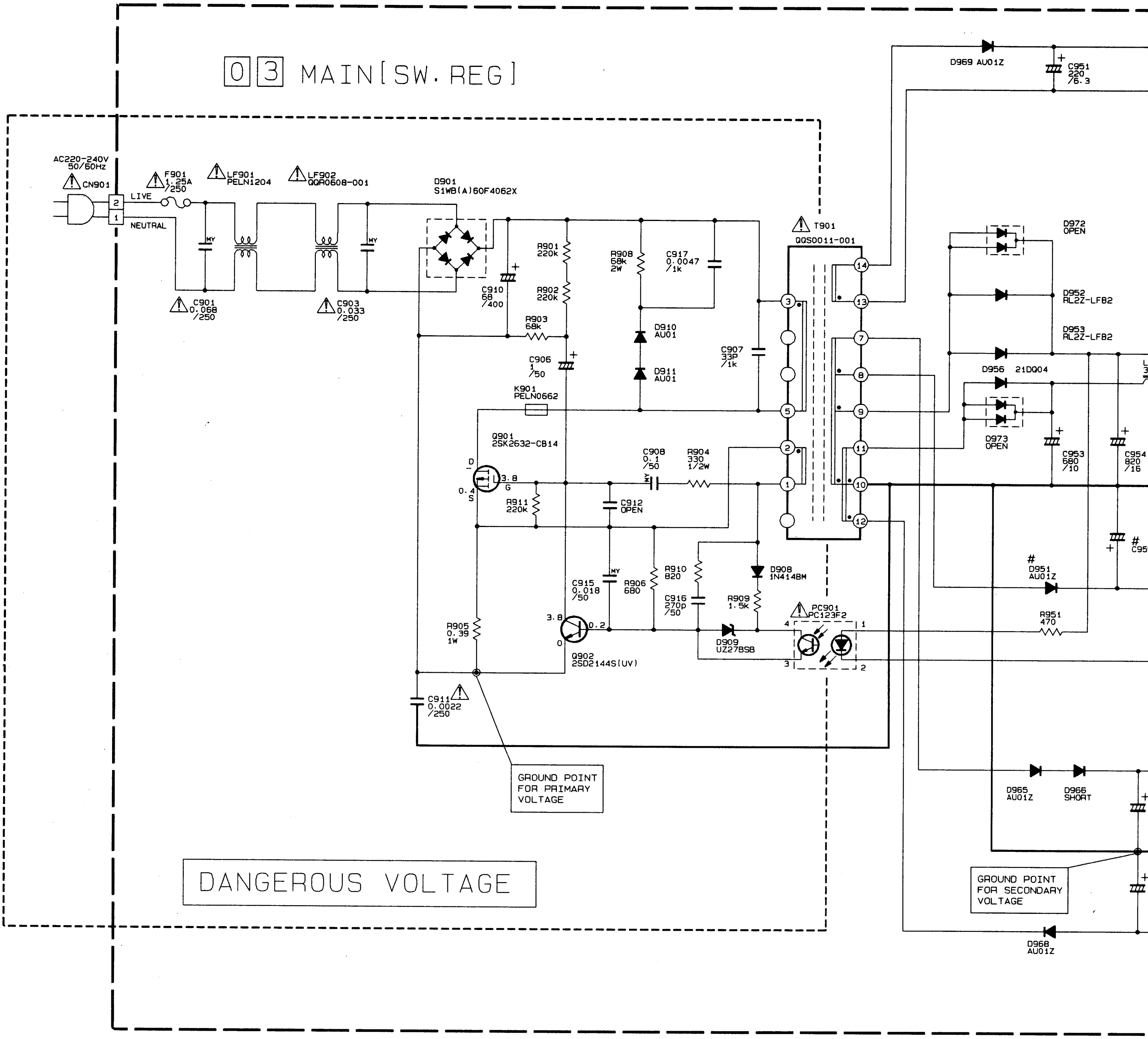


TO SW. REG (Page4-18)
DC(-)
DC(+)
-28V
GND
AL5.8V
V_UP(H)
P.CTL(H)
M12V/17V
M12V
GND
SW5V
SW12V
TO CAP MDA CN701
CAP FG
SW5V
CAP REV(L)
CAP CTL(V)
M12V/17V
GND(C)
NC
GND(M)
TO SERVO (Page4-19)
CAP_FG
V.P_CTL
CTL_CLOCK
CTL_C/D
CFG_C/D
S.DATA
D.FF
REC_ST(H)
DUTY_I/O
6.SH_DET
DRUM_CTL_V
CAP_V_CTL
TO LOADING MOTOR CN703
LDM2
LDM1
TO ROTARY ENCODER CN702
GND(C)
LSC
LSA
NC
LSB
TO TUNER (PAGE4-21·22)
PLL_CLK
I2C_CLK
SYNC_DET
IF_AGC
I2C_DATA
PLL_LOCK
S_CURVE/AFT
PLL_DATA
PLL_CE
A.MUTE(H)
SECAM_VL(H)
P.MUTE(L)
TU_CTL(L)
IC701 HD6433029TA72F
IC702 24LC08B/P
IC703 S-8072BAN
IC704 TA7291S
C701 TIMER CLOCK
CF701 PEY80594
TO DISPLAY CN1201 (Page4-28) CN802
CASS SW
REC SAFEY
AL 5V
S CLK
S DATA
STB
B.UP GND
GND(C)
RC IN
DC(-)
DC(+)
-28V
TO VIDEO/AUDIO (Page4-9)
OS_DATA
OS_CLK
OS_CE
DAV
I2C_CLK
I2C_DATA
TO JOG/SW CN1205 (Page4-27) #CN705
N.C
JSA
JSB
GND
SHUTTLE(L)
J2
C2
J1
TO TERMINAL (Page4-13)
I2C_DATA
I2C_CLK
PERI2(L)
FRONT(H)
GND
R.PAUSE
SCR(H)
P.MUTE(L)
EE(L)
TO VIDEO/AUDIO (Page4-9)
P.MUTE(L)
VIDEO_CLK
VIDEO_DATA
V.P_CTL
COMB_OFF(H)
BEST(L)
SP(L)
DOC_OFF(L)
PB_SPE(L)
SECAM_DET
EE(L)
B/W(H)
COL_CTL
V.APT_ON
N.REC(L)
MESECAM_DET
SYNC_DET
VIDEO_ENV.
A.MUTE(H)
REC_ST(H)
Q704 START SENSOR
Q705 END SENSOR
PS702 SG-248 REEL SENSOR SUPPLY
PS701 SG-248 REEL SENSOR TAKE UP
TP701 TEST
03 MAIN(SYSCON)

NOTE: COMPARISON CHART OF MODELS & MARKS(#).

REF. No	MODELS	
	HR-J245EK	HR-J249EK
D712	NOT USED	USED
D713	NOT USED	USED
R723	OPEN	1k
CN705	NOT USED	USED

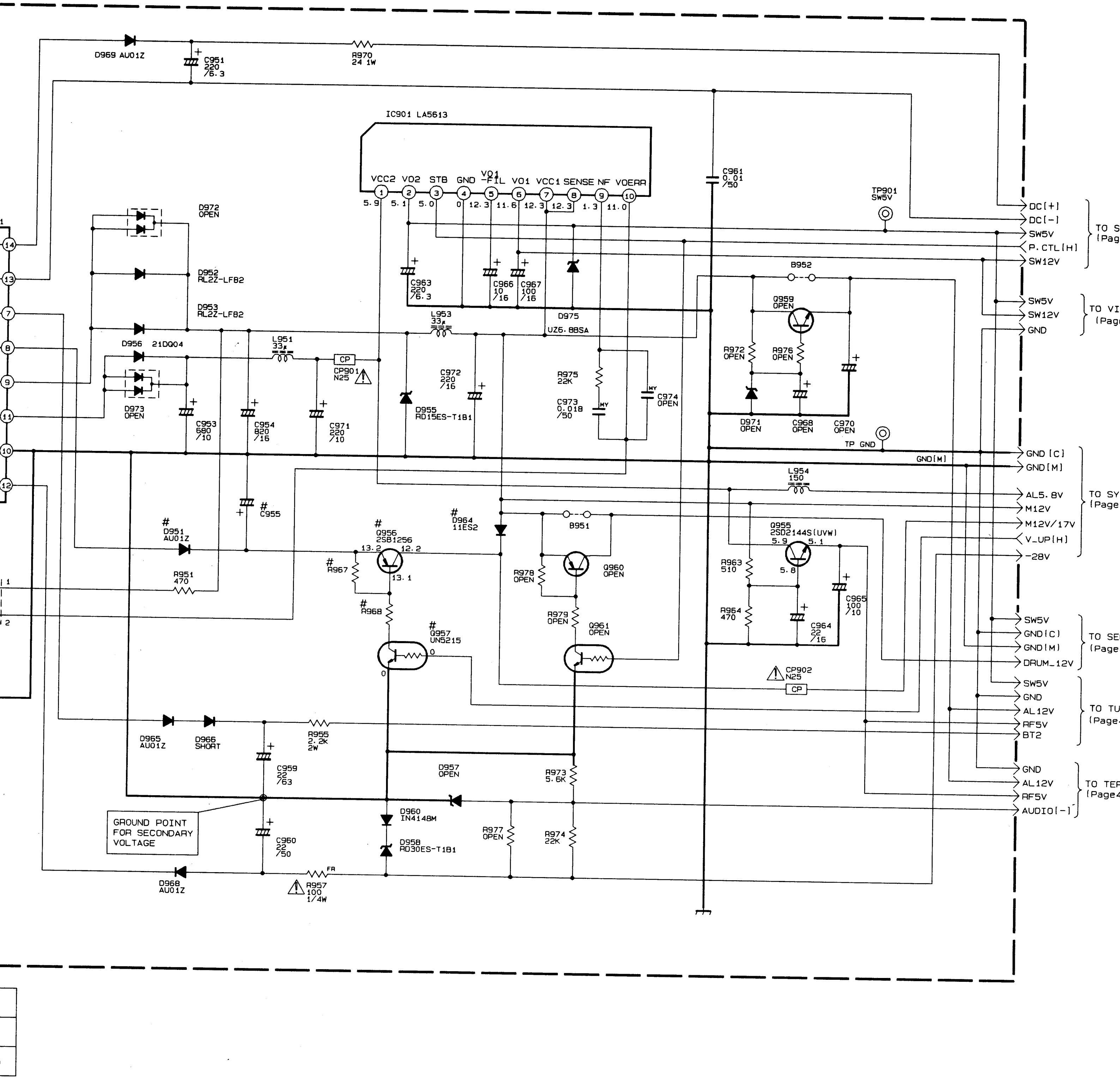
4.8 SW REGULATOR SCHEMATIC DIAGRAM



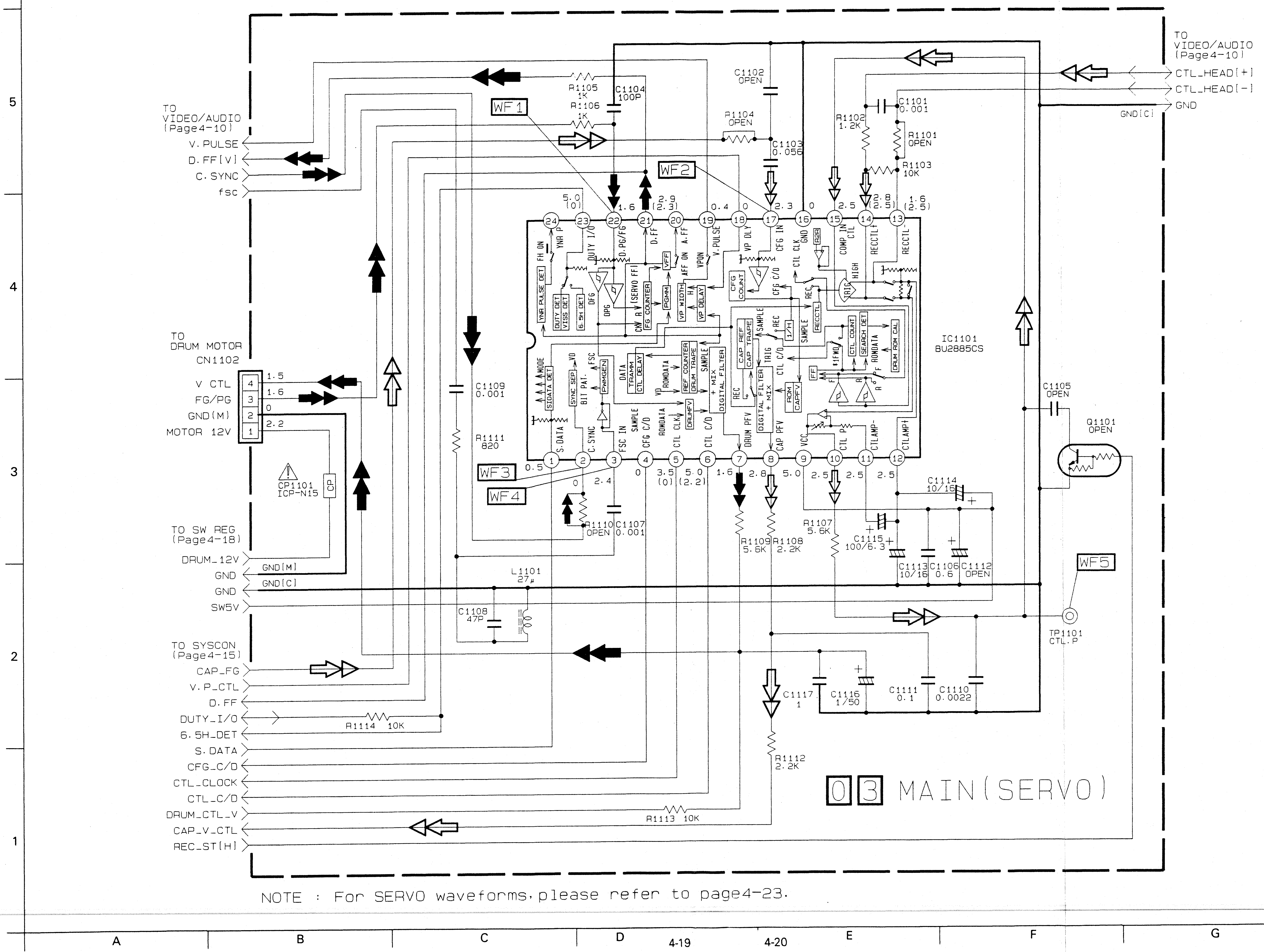
03 MAIN[SW.REG]
AC220-240V 50/60Hz
CN901
LIVE
NEUTRAL
F901 1.25A /250
LF901 PELN1204
LF902 QQR0608-001
C901 0.068 /250
C903 0.033 /250
MY
D901 S1WB(A)60F4062X
C910 68 /400
R901 220k
R902 220k
R903 68k
R908 68k 2W
C917 0.0047 /1k
D910 AU01
D911 AU01
C907 33P /1k
C906 1 /50
K901 PELN0662
Q901 2SK2632-CB14
D
G
S
3.8
0.4
C908 0.1 /50
R904 330 1/2W
R911 220k
C912 OPEN
C915 0.018 /50
R906 680
R910 820
C916 270p /50
D908 1N4148M
R909 1.5k
D909 UZ27BSB
PC901 PC123F2
R905 0.39 1W
Q902 2SD2144S(UV)
3.8
0.2
0
C911 0.0022 /250
GROUND POINT FOR PRIMARY VOLTAGE
T901
QQS0011-001
D969 AU01Z
C951 220 /6.3
D972 OPEN
D952 RL2Z-LF82
D953 RL2Z-LF82
D956 21DQ04
D973 OPEN
C953 680 /10
C954 820 /16
#
D951 AU01Z
R951 470
D965 AU01Z
D966 SHORT
GROUND POINT FOR SECONDARY VOLTAGE
D968 AU01Z
DANGEROUS VOLTAGE

NOTE:COMPARISON CHART OF MODELS & MARKS(#).

	REF. No	Q956	Q957	D951	D964	R967	R968	C955
MODELS	HR-J245EK	NOT USED	NOT USED	NOT USED	SHORT	OPEN	OPEN	OPEN
	HR-J249EK	USED	USED	USED	USED	4.7k	2.2k	180/25

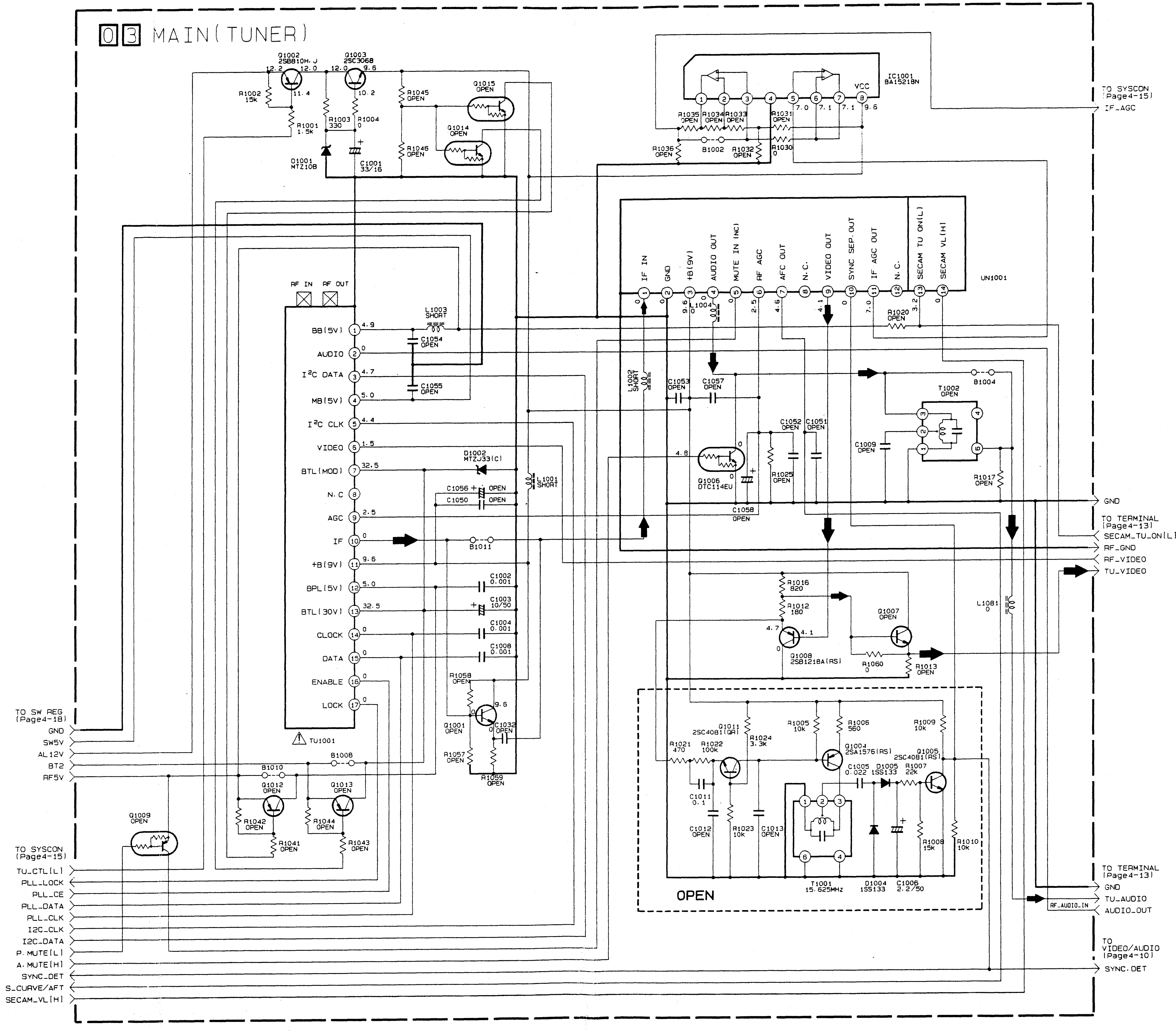

D969 AU01Z
C951 220 /6.3
R970 24 1W
IC901 LA5613
VCC2 VO2 STB GND VO1 -FIL VO1 VCC1 SENSE NF VOERR
1 2 3 4 5 6 7 8 9 10
5.9 5.1 5.0 0 12.3 11.6 12.3 12.3 1.3 11.0
C961 0.01 /50
TP901 SW5V
DC[+]
DC[-]
SW5V
P.CTL[H]
SW12V
TO S (Pag
D972 OPEN
D952 RL2Z-LFB2
D953 RL2Z-LFB2
C963 220 /6.3
C966 10 /16
C967 100 /16
D975
B952
Q959 OPEN
SW5V
SW12V
GND
TO VI (Pag
14
13
7
8
9
11
10
12
L953 33μ
UZ6.8BSA
D956 21DQ04
L951 33μ
CP
CP901 N25
C972 220 /16
R975 22K
C973 0.018 /50
MY
C974 OPEN
R972 OPEN
R976 OPEN
D973 OPEN
C953 680 /10
C954 820 /16
C971 220 /10
D955 RD15ES-T1B1
D971 OPEN
C968 OPEN
C970 OPEN
TP GND
GND[C]
GND[M]
GND[M]
L954 150
AL5.8V
M12V
M12V/17V
V_UP[H]
-28V
TO SY (Page
C955
#
D951 AU01Z
Q956 2SB1256
13.2 12.2
13.1
D964 11ES2
B951
Q955 2SD2144S(UVW)
5.9 5.1
5.8
R967
R951 470
R978 OPEN
Q960 OPEN
R963 510
C965 100 /10
R968
R979 OPEN
Q961 OPEN
R964 470
C964 22 /16
Q957 UN5215
0
0
SW5V
GND[C]
GND[M]
DRUM_12V
TO SE (Page
CP902 N25
CP
SW5V
GND
AL12V
RF5V
BT2
TO TU (Page
D965 AU01Z
D966 SHORT
R955 2.2K 2W
C959 22 /63
D957 OPEN
R973 5.6K
GND
AL12V
RF5V
AUDIO[-]
TO TE (Page4
GROUND POINT FOR SECONDARY VOLTAGE
D960 IN4148M
C960 22 /50
R977 OPEN
R974 22K
D958 RD30ES-T1B1
D968 AU01Z
FR
R957 100 1/4W

4.9 SERVO SCHEMATIC DIAGRAM


6
5
4
3
2
1
TO VIDEO/AUDIO (Page4-10)
V. PULSE
D. FF[V]
C. SYNC
fsc
TO DRUM MOTOR CN1102
V CTL
FG/PG
GND(M)
MOTOR 12V
1.5
1.6
0
2.2
CP1101 ICP-N15
CP
TO SW REG (Page4-18)
DRUM_12V
GND
GND
SW5V
GND[M]
GND[C]
L1101 27μ
C1108 47P
TO SYSCON (Page4-15)
CAP_FG
V. P_CTL
D. FF
DUTY_I/O
6. 5H_DET
S. DATA
CFG_C/D
CTL_CLOCK
CTL_C/D
DRUM_CTL_V
CAP_V_CTL
REC_ST[H]
R1114 10K
R1113 10K
R1105 1K
R1106 1K
C1104 100P
WF1
WF2
WF3
WF4
WF5
C1102 OPEN
R1104 OPEN
C1103 0.056
C1101 0.001
R1102 1.2K
R1101 OPEN
R1103 10K
C1109 0.001
R1111 820
R1110 OPEN
C1107 0.001
R1109 5.6K
R1108 2.2K
R1107 5.6K
C1115 100/6.3
C1114 10/16
C1113 10/16
C1106 0.6
C1112 OPEN
C1105 OPEN
Q1101 OPEN
TP1101 CTL.P
C1117 1
C1116 1/50
C1111 0.1
C1110 0.0022
R1112 2.2K
IC1101 BU2885CS
TO VIDEO/AUDIO (Page4-10)
CTL_HEAD[+]
CTL_HEAD[-]
GND
GND[C]
S.DATA
C.SYNC
FSC IN
CFG C/D
CTL CLK
CTL C/D
DRUM PFV
CAP PFV
VCC
CTL P
CTLAMP-
CTLAMP+
YNR P
FH ON
DUTY I/O
D.PG/FG
D.FF
A.FF
V.PULSE
VP DLY
CFG IN
CTL CLK
GND
COMP IN CTL
RECCTL+
RECCTL-
YNR PULSE DET
DUTY DET
VISS DET
6.5H DET
DFG
DPG
SERVO FF
FG COUNTER
PGMM
VFF
AFF ON
VPON
VP WIDTH
VP DELAY
CFG COUNT
CFG C/O
REC
HIGH
TRIG
SAMPLE
RECCTL
CTL COUNT
SEARCH DET
ROMDATA
DRUM ROM CAL
MODE
SIDATA DET
SYNC SEP
BIT PAT.
FSC
PWMGEN
DATA TRAMM
CTL DELAY
ROMDATA
REF COUNTER
DRUM TRAPE
SAMPLE
DIGITAL FILTER + MIX
CAP REF
CAP TRAPE
1/H
TRIG
CTL C/O
ROM CAPFV
FF
DRUMFV
0.5
0
2.4
3.5 (0)
5.0 (2.2)
1.6
2.8
5.0
2.5
2.5
2.5
5.0 (0)
1.6
2.9 (2.3)
0.4
0
2.3
0
2.5
2.8 (2.5)
1.6 (2.5)
03 MAIN(SERVO)
A
B
C
D
E
F
G
H

NOTE : For SERVO waveforms, please refer to page4-23.

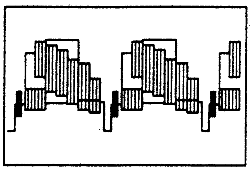
4.10 TUNER SCHEMATIC DIAGRAM


03 MAIN(TUNER)
Q1002 2SB810H,J
Q1003 2SC3068
R1002 15k
R1001 1.5k
R1003 330
R1004 0
D1001 MTZ10B
C1001 33/16
R1045 OPEN
R1046 OPEN
Q1015 OPEN
Q1014 OPEN
IC1001 BA1521BN
VCC
R1035 OPEN
R1034 OPEN
R1033 OPEN
R1031 OPEN
R1030 0
R1036 OPEN
B1002
R1032 OPEN
TO SYSCON (Page4-15)
IF_AGC
UN1001
IF IN
GND
+B(9V)
AUDIO OUT
MUTE IN INC)
RF AGC
AFC OUT
N.C.
VIDEO OUT
SYNC SEP. OUT
IF AGC OUT
N.C.
SECAM TU ON(L)
SECAM VL(H)
L1004
R1020 OPEN
L1002 SHORT
C1053 OPEN
C1057 OPEN
C1052 OPEN
C1051 OPEN
B1004
T1002 OPEN
C1009 OPEN
Q1006 DTC114EU
R1025 OPEN
C1058 OPEN
R1017 OPEN
RF IN
RF OUT
L1003 SHORT
C1054 OPEN
C1055 OPEN
BB(5V)
AUDIO
I²C DATA
MB(5V)
I²C CLK
VIDEO
BTL(MOD)
N.C
AGC
IF
+B(9V)
BPL(5V)
BTL(30V)
CLOCK
DATA
ENABLE
LOCK
TU1001
D1002 MTZJ33(C)
L1001 SHORT
C1056 OPEN
C1050 OPEN
B1011
C1002 0.001
C1003 10/50
C1004 0.001
C1008 0.001
R1058 OPEN
Q1001 OPEN
C1032 OPEN
R1057 OPEN
R1059 OPEN
B1010
B1008
Q1012 OPEN
Q1013 OPEN
R1042 OPEN
R1044 OPEN
R1041 OPEN
R1043 OPEN
Q1009 OPEN
R1016 820
R1012 180
Q1007 OPEN
Q1008 2SB1218A(RS)
R1060 0
R1013 OPEN
L1081 0
Q1011 2SC4081(QR)
R1021 470
R1022 100k
R1024 3.3k
R1005 10k
R1006 560
R1009 10k
Q1004 2SA1576(RS)
Q1005 2SC4081(RS)
C1005 0.022
D1005 1SS133
R1007 22k
C1011 0.1
C1012 OPEN
R1023 10k
C1013 OPEN
R1008 15k
R1010 10k
T1001 15.625MHz
D1004 1SS133
C1006 2.2/50
OPEN
TO SW REG (Page4-18)
GND
SW5V
AL12V
BT2
RF5V
TO SYSCON (Page4-15)
TU_CTL(L)
PLL_LOCK
PLL_CE
PLL_DATA
PLL_CLK
I2C_CLK
I2C_DATA
P. MUTE(L)
A. MUTE(H)
SYNC_DET
S_CURVE/AFT
SECAM_VL(H)
GND
TO TERMINAL (Page4-13)
SECAM_TU_ON(L)
RF_GND
RF_VIDEO
TU_VIDEO
TO TERMINAL (Page4-13)
GND
TU_AUDIO
AUDIO_OUT
RF_AUDIO_IN
TO VIDEO/AUDIO (Page4-10)
SYNC. DET

WAVEFORMS

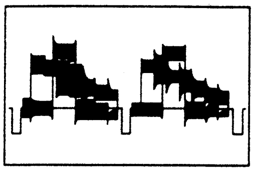
— VIDEO/N. N.AUDIO —

WF1 IC1-61



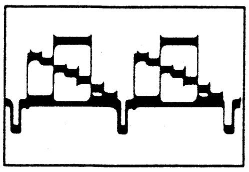
PAL REC 0.82 Vp-p
20 mV/V20 μsec/DIV

WF1 IC1-61



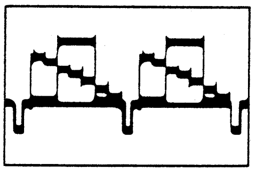
SECAM REC 0.83 Vp-p
20 mV/20 μsec/DIV

WF2 IC1-66



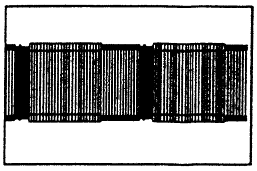
PB 0.51 Vp-p
20 mV/20 μsec/DIV

WF3 IC1-70



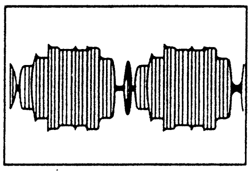
REC/PB 0.51 Vp-p
20 mV/20 μsec/DIV

WF4 IC1-6



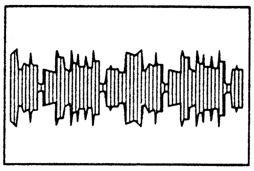
REC 0.4 Vp-p
20 mV/5 msec/DIV

WF5 IC1-13



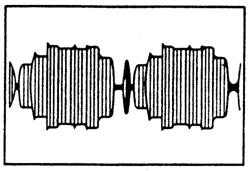
PAL PB 0.6 Vp-p
20 mV/20 μsec.DIV

WF5 IC1-13



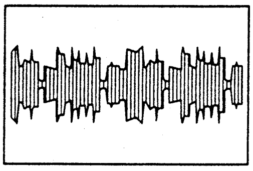
SECAM PB 0.23 Vp-p
10 mV/20 μsec/DIV

WF6 IC1-15



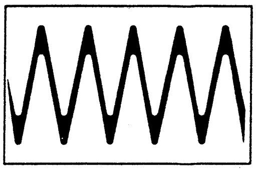
PAL REC 0.4 Vp-p
20 mV/20 μsec/DIV

WF6 IC1-15



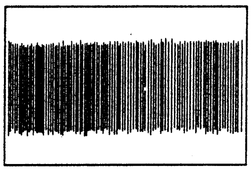
SECAM REC 0.23 Vp-p
10 mV/20 μsec/DIV

WF7 IC1-34



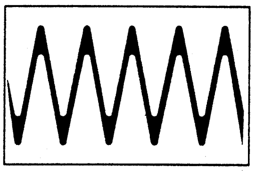
REC 2.1 Vp-p
50 mV/1 msec/DIV

WF8 IC1-38



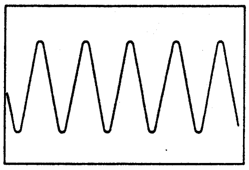
PB 0.03 Vp-p
0.5 mV/5 msec/DIV

WF9 IC1-43



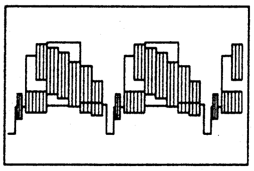
REC 0.3 Vp-p
10 mV/1 msec/DIV

WF10 IC1-46



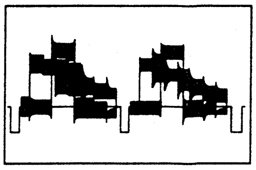
REC/PB 1.3 Vp-p
50 mV/1 msec/DIV

WF11 IC1-57



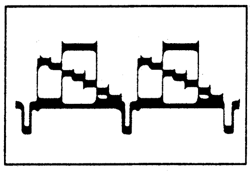
PAL REC/PB 2.2 Vp-p
0.1 V/20 μsec/DIV

WF11 IC1-57



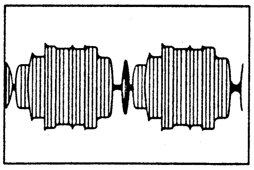
SECAM REC/PB 2.5 Vp-p
0.1 V/20 μsec/DIV

WF12 IC2-5



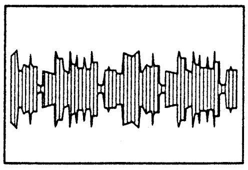
PB 0.44 Vp-p
20 mV/20 μsec/DIV

WF13 IC2-8



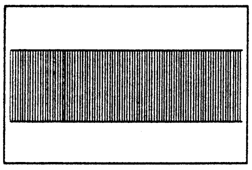
PAL PB 0.44 Vp-p
20 mV/20 μsec/DIV

WF13 IC2-8



SECAM PB 0.18 Vp-p
5 mV/20 μsec/DIV

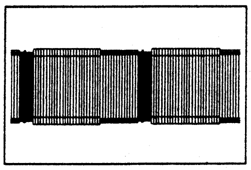
WF14 TP333
A.ERASE



REC 33.0 Vp-p
1 V/1 msec/DIV

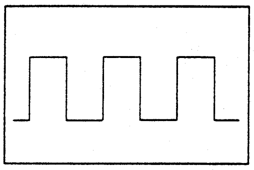
— PRE/REC —

WF1 TP106
PB FM



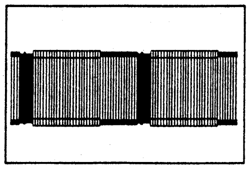
PB 0.45 Vp-p
20 mV/5 msec/DIV

WF2 TP111
D.FF



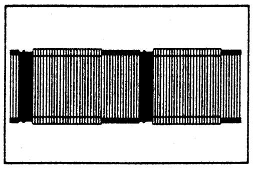
REC/PB 5.2 Vp-p
0.2 V/10 msec/DIV

WF3 IC101-22



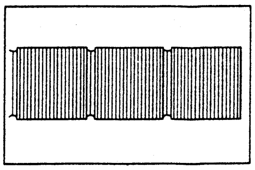
PB 0.45 Vp-p
20 mV/5 msec/DIV

WF4 IC101-28



REC 0.03 Vp-p
5 mV/5 msec/DIV

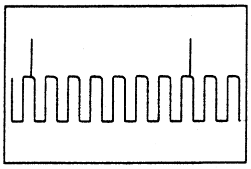
WF5 IC101-4



REC 3.4 Vp-p
0.1 V/5 msec/DIV

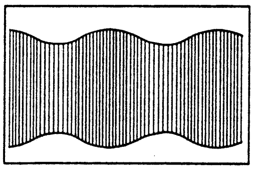
— SERVO —

WF1 IC1101-22
D.PG/FG



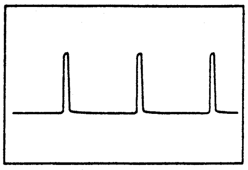
REC/PB 4.0 Vp-p
0.1 V/5 msec/DIV

WF2 IC1101-17
CAP.FG



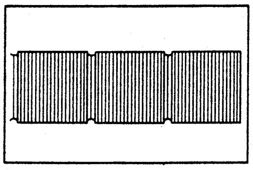
REC/PB 2.1 Vp-p
0.1 V/10 msec/DIV

WF3 IC1101-2
C.SYNC



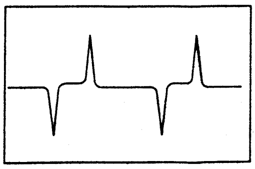
REC 4.8 Vp-p
0.1 V/20 μsec/DIV

WF4 IC1101-3
FSC



REC/PB 0.5 Vp-p
20 mV/5 msec/DIV

WF5 TP1101
CTL PULSE

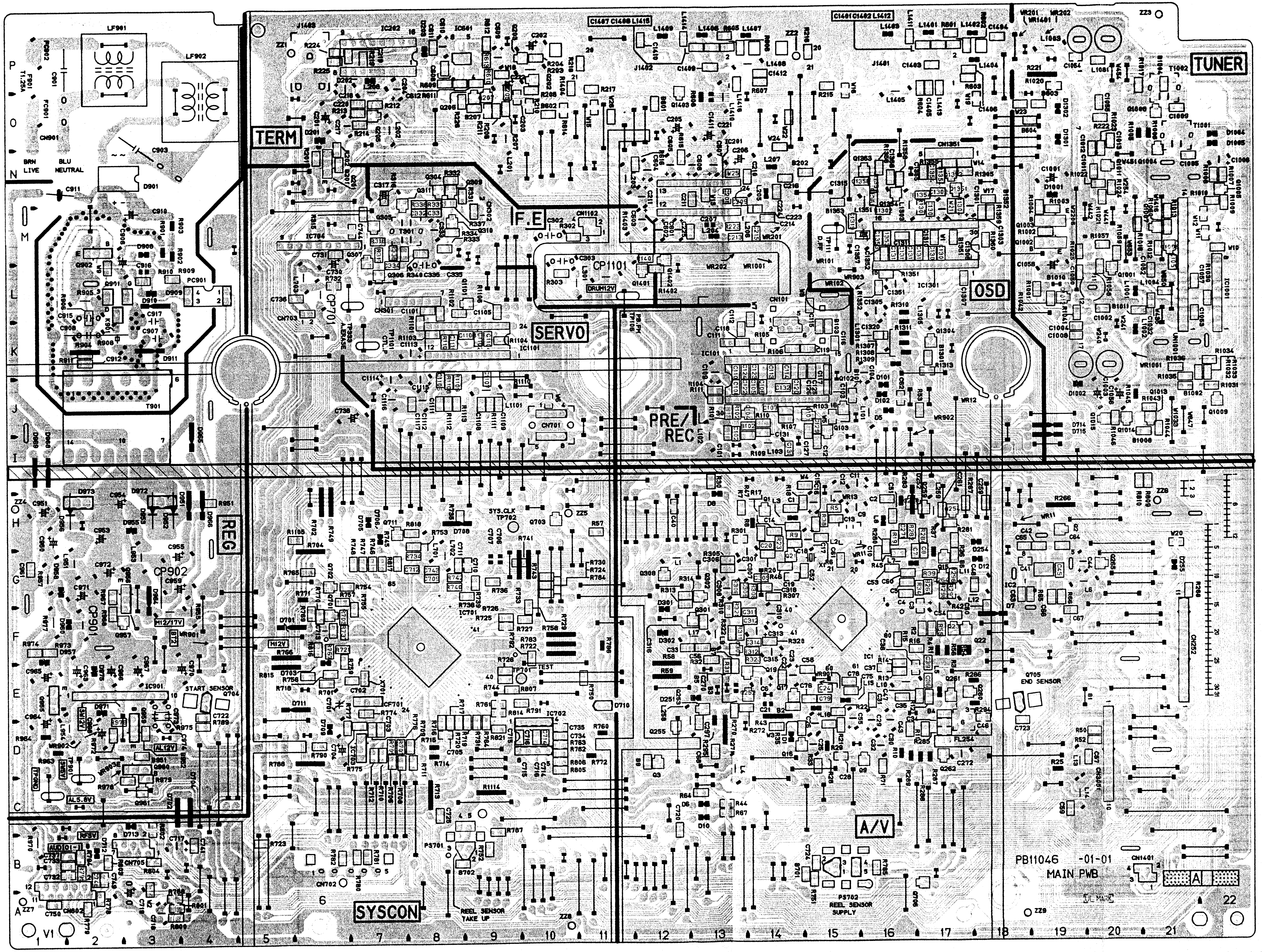


PB 2.4 Vp-p
0.1 V/10 msec/DIV

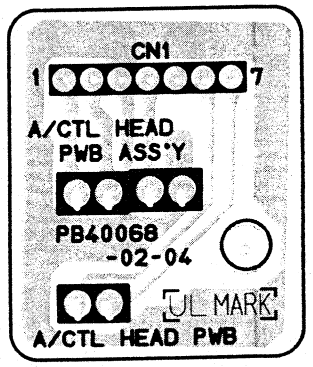
COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION		
CAPACITOR			
C1	B	C	14H
C2	B	C	16H
C3	B	C	17F
C4	B	C	16G
C5	B	C	16G
C6	A	D	14E
C7	B	C	16G
C8	B	C	17G
C9	A	D	15H
C10	B	C	16G
C11	A	D	16I
C12	A	D	15H
C13	B	C	15H
C14	B	C	14H
C15	B	C	15H
C16	A	D	15H
C17	A	D	15H
C18	B	C	14H
C19	B	C	14G
C20	B	C	14G
C21	A	D	14E
C22	B	C	14E
C23	A	D	14E
C24	B	C	15E
C25	A	D	15D
C26	A	D	15D
C28	B	C	15D
C29	A	D	16D
C30	A	D	16D
C31	B	C	16E
C32	A	D	16D
C33	B	C	12F
C34	B	C	17D
C35	B	C	16E
C36	B	C	17E
C37	B	C	16E
C38	B	C	16E
C39	B	C	17E
C40	B	C	12H
C41	B	C	18G
C42	B	C	19G
C43	B	C	16D
C44	A	D	19G
C45	B	C	19G
C46	B	C	18D
C47	B	C	17E
C48	B	C	18G
C50	B	C	18F
C51	B	C	16H
C52	B	C	15G
C53	B	C	16G
C54	A	D	17F
C55	A	D	15D
C56	B	C	13F
C57	B	C	20D
C58	B	C	15E
C59	B	C	19C
C60	B	C	16G
C61	B	C	15G
C62	B	C	16J
C63	B	C	18G
C64	B	C	19G
C65	B	C	18G
C66	B	C	19G
C67	B	C	19F
C68	B	C	13D
C75	B	C	15E
C76	B	C	15E
C78	B	C	15E
C79	B	C	15E
C101	B	C	13I
C102	B	C	13I
C103	B	C	15J
C104	A	D	16J
C105	B	C	14J
C106	B	C	14J
C107	B	C	14J
C108	B	C	13J
C109	A	D	13J
C110	B	C	13K
C111	B	C	13K
C112	B	C	13K
C113	B	C	14K
C114	B	C	14K
C115	B	C	15K
C116	B	C	15K
C117	B	C	15K
C118	B	C	13K
C119	B	C	15K
C120	B	C	14J
C121	B	C	15I
C122	B	C	13J
C123	B	C	14K
C124	B	C	13K
C125	B	C	15K
C126	B	C	14K
C127	B	C	15I
C129	B	C	15J
C130	B	C	14I
C131	B	C	14I
C132	B	C	14J
C201	A	D	6O
C202	A	D	10P
C203	B	C	9O
C204	A	D	7O
C205	A	D	12O
C206	A	D	13N
C207	A	D	13M
C208	B	C	13N
C209	B	C	13N
C210	B	C	14N
C211	B	C	13N
C212	A	D	12N
C213	B	C	13M
C214	B	C	14M
C215	B	C	14M
C216	B	C	14N
C217	A	D	6O
C218	A	D	6P
C219	B	C	7P
C220	B	C	7O
C221	A	D	13O
C222	A	D	9P
C223	B	C	14M
C224	B	C	14N
C225	B	C	13M
C259	B	C	18H
C261	B	C	17H
C270	A	D	13E
C271	B	C	16H
C272	A	D	17D
C297	B	C	13D
C301	A	D	14G
C302	A	D	10M
C303	A	D	10L
C305	B	C	14G
C306	B	C	13G
C307	A	D	13G
C308	A	D	13G
C309	B	C	13G
C310	A	D	14F
C311	B	C	14F
C312	B	C	14F
C313	A	D	14F
C314	B	C	14F
C315	A	D	14F
C316	B	C	13F
C317	A	D	7N
C318	B	C	14G
C331	B	C	8M
C332	B	C	8M
C333	A	D	8M
C334	B	C	7L
C335	A	D	8L
C601	A	D	12M
C602	A	D	12M
C603	A	D	12M
C604	A	D	12N
C605	A	D	12N
C606	A	D	13N
C607	A	D	13N
C608	B	C	8P
C609	A	D	9P
C610	A	D	8P
C611	B	C	8P
C612	B	C	8P
C701	A	D	6E
C702	B	C	7E
C703	B	C	7D
C704	A	D	6D
C705	B	C	8D
C706	A	D	9G
C707	A	D	9G
C709	B	C	8G
C710	B	C	9G
C711	B	C	8G
C712	B	C	8G
C713	B	C	6F
C714	B	C	10D
C715	B	C	9D
C716	B	C	10D
C717	A	D	4B
C718	A	D	3A
C719	A	D	3A
C720	B	C	12B
C722	B	C	4E
C723	B	C	18D
C724	B	C	15B
C725	B	C	8C
C730	A	D	6L
C731	B	C	6M
C732	B	C	2B
C733	B	C	2B
C734	B	C	10D
C735	B	C	10D
C736	B	C	6L
C737	B	C	2B
C738	A	D	7J
C741	B	C	4B
C742	A	D	7E
C743	B	C	8G
C744	B	C	7M
C748	B	C	2B
C749	B	C	2B
C750	B	C	1A
C751	A	D	7E
C901	A	D	2P
C903	A	D	2O
C906	A	D	3M
C907	A	D	3K
C908	A	D	2K
C910	A	D	2M
C911	A	D	2N
C912	B	C	2K
C915	A	D	2L
C916	A	D	3L
C917	A	D	3L
C951	A	D	1H
C953	A	D	2H
C954	A	D	3H
C955	A	D	4G
C959	A	D	4G
C960	A	D	1H
C961	B	C	1G
C963	A	D	2E
C964	A	D	1D
C965	A	D	1E
C966	A	D	2E
C967	A	D	3E
C968	A	D	2D
C970	A	D	4E
C971	A	D	2G
C972	A	D	2G
C973	A	D	3D
C974	A	D	3D
C1001	A	D	19N
C1002	B	C	20L
C1003	A	D	20J
C1004	B	C	19K
C1005	B	C	21N
C1006	A	D	22N
C1008	B	C	19K
C1009	B	C	21O
C1011	B	C	20N
C1012	B	C	20N
C1013	B	C	20O
C1032	B	C	21L
C1050	B	C	19L
C1051	B	C	21L
C1052	B	C	21L
C1053	B	C	21K
C1054	B	C	19P
C1055	B	C	20O
C1056	A	D	20J
C1057	B	C	21L
C1058	A	D	19L
C1101	B	C	8L
C1102	B	C	9K
C1103	B	C	9K
C1104	B	C	9K
C1105	B	C	8L
C1106	B	C	8J
C1107	B	C	9J
C1108	B	C	9J
C1109	B	C	9J
C1110	B	C	8K
C1111	B	C	8J
C1112	A	D	8J
C1113	A	D	8K
C1114	A	D	7J
C1115	A	D	8J
C1116	A	D	7J
C1117	B	C	8J
C1301	A	D	17M
C1302	B	C	17N
C1303	A	D	17M
C1304	B	C	17M
C1305	A	D	16L
C1306	B	C	18M
C1307	B	C	17L
C1308	B	C	17M
C1309	B	C	17M
C1310	B	C	17M
C1311	B	C	16M
C1312	B	C	16M
C1315	B	C	15M
C1316	B	C	17M
C1317	B	C	16M
C1318	B	C	16M
C1319	B	C	15M
C1320	B	C	16K
C1351	A	D	16L
C1352	B	C	16M
C1353	B	C	16M
C1354	B	C	17N
C1355	B	C	17N
C1356	B	C	16N
C1357	A	D	16M
C1358	B	C	16N
C1401	B	C	17P
C1402	B	C	17P
C1403	B	C	17P
C1404	B	C	18P
C1405	B	C	17O
C1406	B	C	17P
C1407	B	C	13P
C1408	B	C	13P
C1409	B	C	13P
C1410	B	C	12P
C1411	A	D	13O
C1412	B	C	14P
CONNECTOR			
CN101	A	D	14K
CN252	A	D	21E
CN301	A	D	7L
CN302	A	D	9M
CN701	A	D	10J
CN702	A	D	6B
CN703	A	D	6L
CN705	A	D	3B
CN802	A	D	2A
CN901	A	D	1O
CN1102	A	D	11M
CN1351	A	D	17N
CN1401	A	D	21B
CN3051	A	D	20E
CIRCUIT PROTECTOR			
CP701	A	D	6L
CP901	A	D	2F
CP902	A	D	3F
CP1101	A	D	11L
DIODE			
D1	A	D	14D
D5	A	D	16J
D6	A	D	13C
D7	A	D	18F
D8	A	D	13H
D10	A	D	13C
D12	A	D	17G
D101	A	D	16J
D102	A	D	16J
D201	A	D	6O
D202	A	D	7P
D203	A	D	8P
D251	A	D	13E
D252	A	D	16H
D254	A	D	17H
D255	A	D	21G
D301	A	D	12F
D302	A	D	12F
D701	A	D	6F
D702	A	D	3C
D703	A	D	6E
D704	A	D	4C
D705	A	D	7H
D706	A	D	7H
D708	A	D	8H
D709	A	D	6D
D710	A	D	11E
D711	A	D	6E
D712	A	D	2B
D713	A	D	3C
D714	A	D	18J
D715	A	D	18I
D901	B	C	2N
D908	A	D	3M
D909	A	D	3L
D910	A	D	3L
D911	A	D	3K
D951	A	D	4I
D952	A	D	3I
D953	A	D	3I
D955	A	D	3H
D956	A	D	2I
D957	A	D	1F
D958	A	D	1G
D960	A	D	2F
D964	A	D	3G
D965	A	D	4J
D966	A	D	4I
D968	A	D	1I
D969	A	D	1I
D971	A	D	2E
D972	A	D	3H
D973	A	D	2H
D975	A	D	2F
D1001	A	D	19N
D1002	A	D	20J
D1004	A	D	22O
D1005	A	D	22N
D1301	A	D	19N
D1302	A	D	19O
IC			
IC1	B	C	15F
IC2	B	C	19G
IC101	A	D	13K
IC201	A	D	13M
IC202	A	D	8P
IC601	B	C	9P
IC701	B	C	8F
IC702	A	D	9D
IC703	A	D	7D
IC704	A	D	7M
IC901	A	D	2E
IC1001	A	D	22K
IC1101	A	D	9K
IC1301	A	D	18L
COIL			
L1	A	D	12G
L2	A	D	15H
L3	A	D	14H
L4	A	D	13D
L5	A	D	17E
L6	A	D	20G
L7	A	D	16G
L8	A	D	16H
L9	A	D	13F
L10	A	D	16E
L11	A	D	18G
L12	A	D	18G
L13	A	D	19C
L14	A	D	19C
L15	A	D	15E
L16	A	D	15E
L17	A	D	13F
L101	A	D	16J
L102	A	D	13J
L103	A	D	14I
L201	A	D	9N
L202	A	D	7O
L203	A	D	11N
L204	A	D	13M
L205	A	D	14M
L206	A	D	14M
L207	A	D	14N
L208	A	D	7O
L258	A	D	13D
L259	A	D	17H
L301	A	D	11L
L701	A	D	8H
L702	A	D	8G
L703	A	D	6L
L951	A	D	2G
L953	A	D	3H
L954	A	D	2E
L1001	A	D	20L
L1002	A	D	20K
L1003	A	D	19P
L1004	B	C	21L
L1081	B	C	20P
L1101	A	D	9J
L1301	A	D	16K
L1303	A	D	16M
L1305	A	D	17K
L1351	A	D	16N
L1352	A	D	16K
L1401	A	D	17P
L1402	A	D	18P
L1403	A	D	16P
L1404	A	D	18P
L1405	A	D	16O
L1406	A	D	13P
L1407	A	D	14P
L1408	A	D	14P
L1409	A	D	12P
L1410	A	D	13O
L1411	B	C	16P
L1412	B	C	17P
L1413	B	C	17O
L1414	B	C	12P
L1415	B	C	13P
L1416	B	C	13P
TRANSISTOR			
Q1	B	C	14H
Q2	B	C	19H
Q3	B	C	12D
Q9	B	C	16D
Q15	B	C	17G
Q16	B	C	14D
Q17	B	C	14E
Q19	B	C	14E
Q21	B	C	14G
Q22	B	C	17F
Q23	B	C	17F
Q101	B	C	15J
Q102	B	C	15J
Q103	B	C	15I
Q104	B	C	14J
Q201	A	D	6N
Q202	B	C	10P
Q203	B	C	10P
Q205	B	C	7O
Q206	B	C	9O
Q207	B	C	9O
Q252	B	C	14E
Q253	B	C	13E
Q254	B	C	17H
Q255	B	C	12D
Q258	B	C	16H
Q259	B	C	17H
Q260	B	C	17E
Q261	B	C	17E
Q262	B	C	17D
Q264	B	C	17G
Q265	B	C	20G
Q301	B	C	13F
Q302	B	C	13G
Q303	B	C	13F
Q304	B	C	8N
Q305	B	C	7M
Q306	B	C	7L
Q307	B	C	7M
Q308	B	C	12G
Q309	B	C	8N
Q310	B	C	8M
Q311	B	C	7M
Q701	B	C	6F
Q702	B	C	6G
Q703	B	C	10H
Q704	A	D	4E
Q705	A	D	18E
Q706	B	C	17B
Q711	B	C	7H
Q901	A	D	2L
Q902	A	D	2M
Q955	A	D	1E
Q956	A	D	3G
Q957	B	C	3F
Q959	A	D	3D
Q960	A	D	3D
Q961	B	C	3C
Q1001	B	C	20L
Q1002	A	D	19M
Q1003	A	D	19M
Q1004	B	C	21N
Q1005	B	C	22N
Q1006	B	C	21O
Q1007	B	C	21M
Q1008	B	C	21M
Q1009	B	C	22J
Q1011	B	C	20N
Q1012	B	C	19L
Q1013	B	C	21J
Q1014	B	C	20J
Q1015	B	C	20J
Q1101	B	C	9L
Q1304	B	C	17K
Q1351	B	C	17N
Q1352	B	C	17N
Q1353	B	C	16N
Q1354	B	C	16N
Q1401	B	C	12L
Q1402	B	C	12L
Q1403	B	C	12O
RESISTOR			
R1	A	D	17F
R2	B	C	17F
R3	A	D	17F
R4	B	C	17F
R5	B	C	15H
R6	B	C	15H
R7	B	C	13H
R8	A	D	14H
R9	B	C	14H
R10	A	D	16D
R11	B	C	17D
R12	B	C	17E
R13	B	C	16E
R14	B	C	16E
R15	B	C	16F
R16	B	C	17F
R17	B	C	14H
R18	B	C	14H
R19	B	C	16H
R20	B	C	14G
R21	B	C	15D
R22	B	C	15E
R23	B	C	14H
R25	A	D	19D
R28	A	D	15D
R29	B	C	15D
R30	B	C	13I
R31	B	C	13E
R32	B	C	13E
R33	B	C	15D
R34	B	C	17G
R35	B	C	14D
R36	B	C	17H
R37	A	D	17G
R38	B	C	15H
R39	B	C	17G
R42	B	C	17F
R43	A	D	14D
R44	B	C	13C
R45	B	C	16G
R46	B	C	14G
R47	B	C	14H
R50	B	C	20D
R52	B	C	20D
R53	B	C	17J
R54	A	D	17F
R55	B	C	17F
R56	A	D	17F
R57	B	C	11H
R58	A	D	12E
R59	A	D	12E
R64	B	C	13C
R65	B	C	19G
R66	B	C	19G
R67	B	C	13C
R71	B	C	16D
R101	B	C	13J
R102	B	C	13J
R103	B	C	14J
R104	B	C	13J
R105	B	C	14K
R106	B	C	14K
R107	B	C	14J
R109	B	C	14I
R110	B	C	14J
R111	B	C	13J
R201	B	C	6N
R202	B	C	6N
R203	A	D	10P
R204	B	C	10P
R205	B	C	9O
R206	B	C	9O
R207	B	C	9O
R208	B	C	10O
R210	B	C	10O
R211	B	C	9O
R212	B	C	7O
R213	B	C	7O
R214	B	C	7O
R215	B	C	15P
R216	B	C	15P
R217	B	C	11O
R218	B	C	11P
R219	B	C	7P
R221	A	D	19P
R222	B	C	20O
R223	B	C	13M
R224	B	C	6P
R225	B	C	6P
R226	B	C	9O
R266	A	D	19H
R267	B	C	17H
R268	B	C	21G
R270	B	C	13E
R271	A	D	13E
R272	B	C	13E
R280	B	C	16G
R281	B	C	17H
R282	B	C	16H
R283	A	D	16H
R284	B	C	17H
R285	B	C	17D
R286	A	D	18E
R287	A	D	17D
R288	A	D	17D
R289	A	D	16D
R294	A	D	18E
R295	A	D	13E
R296	B	C	17G
R297	B	C	17G
R298	B	C	17G
R301	B	C	13H
R302	B	C	10M
R303	B	C	10L
R305	B	C	13G
R306	B	C	13G
R307	B	C	14G
R308	B	C	14G
R310	B	C	13F
R311	B	C	13F
R312	B	C	14F
R313	B	C	12F
R314	B	C	12G
R315	B	C	7M
R316	B	C	7N
R317	B	C	7M
R318	B	C	7M
R320	B	C	14F
R321	B	C	13F
R322	B	C	13F
R323	B	C	14E
R331	B	C	9N
R332	B	C	8N
R333	B	C	8M
R334	B	C	8M
R335	B	C	8N
R336	B	C	8N
R337	B	C	8N
R338	B	C	7M
R339	B	C	7M
R340	B	C	8M
R601	B	C	17P
R602	B	C	17P
R603	B	C	17P
R604	B	C	17O
R605	B	C	13P
R606	B	C	13P
R607	B	C	14P
R608	A	D	13O
R609	B	C	8P
R610	B	C	9P
R611	B	C	9P
R612	B	C	9P
R613	B	C	9P
R614	B	C	10O
R615	B	C	12N
R616	B	C	12N
R701	B	C	6E
R702	A	D	6H
R703	B	C	6F
R704	A	D	6G
R705	B	C	7D
R706	B	C	7D
R707	B	C	7D
R708	B	C	7D
R709	B	C	8D
R710	B	C	7D
R711	B	C	8D
R712	B	C	7D
R713	A	D	8C
R714	A	D	8D
R715	A	D	8D
R716	B	C	8D
R717	B	C	8D
R718	B	C	6E
R719	B	C	9D
R720	B	C	8D
R721	B	C	6F
R722	A	D	11F
R723	B	C	5B
R724	B	C	10G
R725	B	C	9F
R726	B	C	9F
R727	B	C	10F
R728	B	C	9E
R729	B	C	10F
R730	B	C	10G
R731	B	C	9D
R732	B	C	6L
R733	A	D	9G
R734	B	C	8G
R735	B	C	8H
R736	B	C	9G
R737	B	C	6F
R738	B	C	9G
R739	B	C	9G
R740	B	C	8G
R741	B	C	9G
R742	B	C	8G
R743	A	D	10G
R744	B	C	9E
R745	B	C	7G
R746	B	C	7G
R747	B	C	7G
R748	B	C	7G
R749	A	D	6H
R750	B	C	11E
R751	B	C	15B
R752	B	C	9B
R753	B	C	8H
R754	B	C	6G
R755	B	C	7F
R756	B	C	6E
R757	B	C	6G
R758	A	D	11F
R759	B	C	6E
R760	A	D	11D
R761	B	C	9E
R762	B	C	10D
R763	B	C	10D
R764	B	C	9D
R765	B	C	6G
R766	A	D	6F
R767	B	C	6F
R768	B	C	3A
R769	B	C	6F
R770	B	C	6F
R771	A	D	6G
R772	A	D	11D
R774	B	C	7E
R775	B	C	7D
R776	B	C	7D
R777	B	C	6D
R778	B	C	2A
R779	B	C	2A
R780	B	C	7B
R781	B	C	7B
R782	B	C	6B
R783	A	D	11F
R784	B	C	10G
R785	B	C	16B
R786	A	D	11F
R787	B	C	9B
R788	A	D	6D
R789	B	C	4D
R790	B	C	6D
R791	B	C	10E
R792	B	C	10F
R794	B	C	2B
R795	B	C	2B
R800	B	C	3A
R801	B	C	3A
R802	B	C	3C
R803	B	C	2B
R804	B	C	3B
R805	B	C	10D
R806	B	C	10D
R807	B	C	9E
R809	B	C	21I
R810	B	C	20I
R814	B	C	9E
R815	A	D	6E
R816	B	C	6F
R817	B	C	7G
R818	B	C	8H
R821	B	C	9D
R901	A	D	3M
R902	A	D	3L
R903	A	D	3M
R904	A	D	2K
R905	A	D	2L
R906	B	C	2L
R908	A	D	1K
R909	B	C	3L
R910	B	C	3L
R911	B	C	2K
R951	B	C	4H
R955	A	D	4F
R957	A	D	1G
R963	A	D	2D
R964	A	D	1D
R967	B	C	2G
R968	B	C	2F
R970	A	D	1B
R972	B	C	2D
R973	B	C	1F
R974	B	C	1F
R975	B	C	3E
R976	B	C	2D
R977	A	D	1F
R978	B	C	3C
R979	B	C	3C
R1001	B	C	19L
R1002	B	C	19M
R1003	B	C	19M
R1004	B	C	19M
R1005	A	D	20O
R1006	A	D	21O
R1007	B	C	22N
R1008	B	C	22N
R1009	B	C	22M
R1010	B	C	22M
R1012	B	C	21M
R1013	B	C	21M
R1016	B	C	20M
R1017	B	C	20O
R1020	B	C	19O
R1021	B	C	20N
R1022	B	C	20N
R1023	B	C	20N
R1024	B	C	20N
R1025	B	C	19M
R1030	B	C	22L
R1031	B	C	22J
R1032	B	C	22J
R1033	B	C	22J
R1034	B	C	22K
R1035	B	C	21J
R1036	B	C	21K
R1041	B	C	19L
R1042	B	C	19L
R1043	B	C	21J
R1044	B	C	21I
R1045	A	D	20J
R1046	B	C	20J
R1057	B	C	20M
R1058	B	C	20L
R1059	B	C	20M
R1060	B	C	21M
R1101	B	C	8K
R1102	B	C	8L
R1103	B	C	8K
R1104	B	C	9K
R1105	B	C	6H
R1106	B	C	9L
R1107	B	C	8K
R1108	B	C	8J
R1109	B	C	8J
R1110	B	C	9J
R1111	B	C	9J
R1112	B	C	8J
R1113	B	C	8J
R1114	A	D	9C
R1301	B	C	17M
R1302	B	C	16M
R1304	B	C	17M
R1305	B	C	17N
R1307	A	D	16K
R1308	A	D	16K
R1309	A	D	17K
R1310	A	D	16L
R1311	A	D	16K
R1313	B	C	17K
R1351	B	C	16L
R1352	B	C	16L
R1353	B	C	16M
R1354	B	C	17N
R1355	B	C	17N
R1356	B	C	16N
R1357	B	C	16N
R1358	B	C	16N
R1359	B	C	18M
R1360	B	C	18M
R1361	B	C	16N
R1401	B	C	12M
R1402	B	C	12L
R1403	A	D	11M
R1404	B	C	10P
TEST POINT			
TP106	A	D	11L
TP111	A	D	15M
TP333	A	D	7L
TP701	A	D	10E
TP702	A	D	9H
TP901	A	D	2C
TP1101	A	D	7K
TPGND	A	D	1C
OTHERS			
CF701	A	D	7E
F901	A	D	1O
FL254	A	D	17D
J1401	A	D	16P
J1402	A	D	12P
J1403	A	D	6P
K901	A	D	2K
LF901	A	D	2P
LF902	A	D	4P
PC901	A	D	4L
PS701	A	D	9B
PS702	A	D	15B
T301	A	D	7M
T901	A	D	2K
T1001	A	D	21N
T1002	A	D	21O
TU1001	A	D	20P
UN1001	A	D	21K
WR11	A	D	15G
WR201	A	D	14M
WR202	A	D	19Q
WR901	A	D	15E
WR902	A	D	2D
WR903	A	D	16L
WR1001	A	D	14M
X1	A	D	14G
X701	A	D	7E

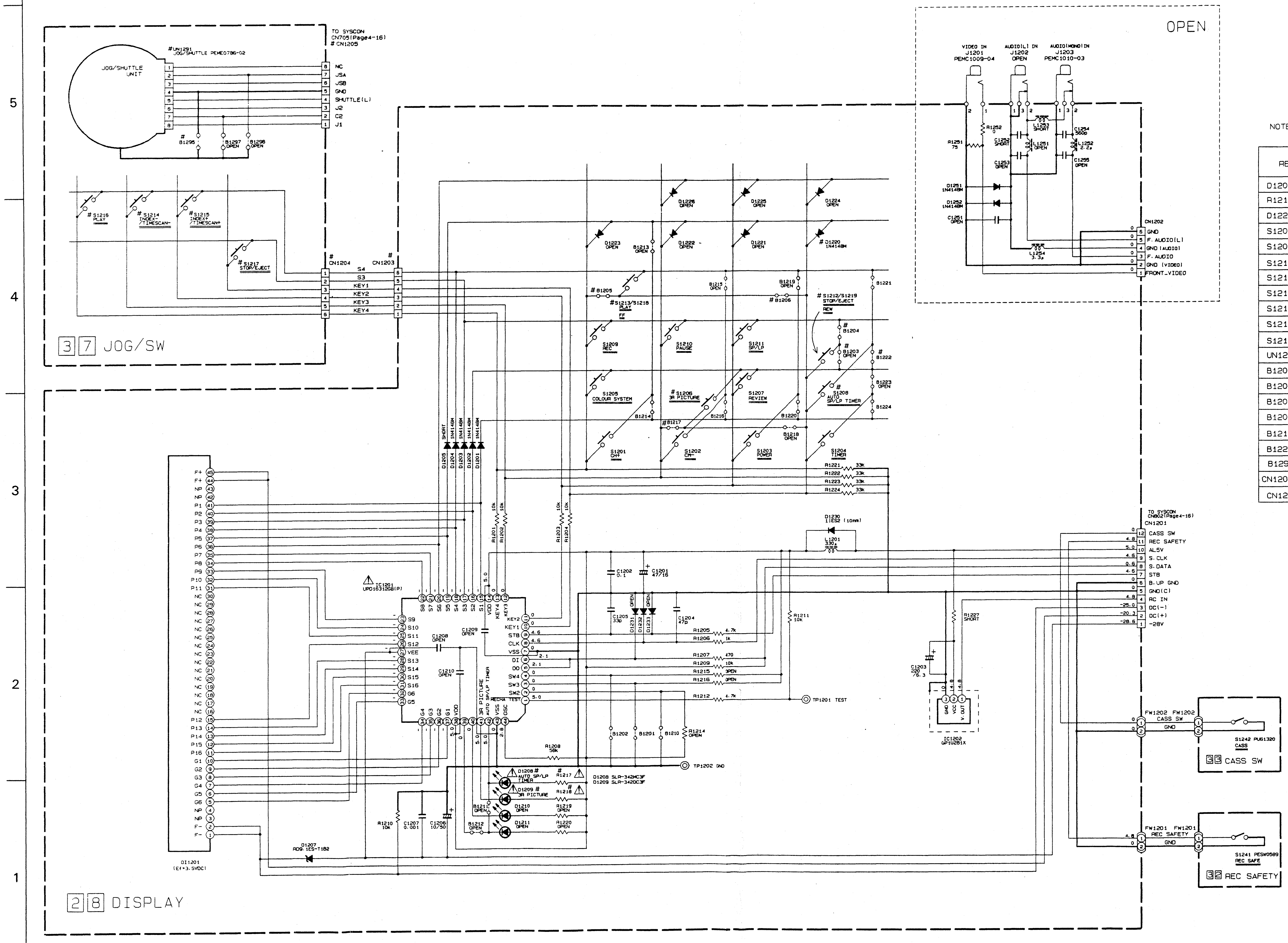
4.11 MAIN AND A/C HEAD CIRCUIT BOARDS


TERM
F.E
SERVO
PRE/REC
OSD
TUNER
REG
SYSCON
A/V
CP1101
CP701
CP902
CP901
BRN LIVE
BLU NEUTRAL
START SENSOR
END SENSOR
REEL SENSOR TAKE UP
REEL SENSOR SUPPLY
SYS.CLK
TEST
PB11046 -01-01
MAIN PWB
UL MARK

— A/C HEAD —


CN1
1
7
A/CTL HEAD
PWB ASS'Y
PB40068
-02-04
A/CTL HEAD PWB
UL MARK

4.12 DISPLAY AND JOG/SW SCHEMATIC DIAGRAM

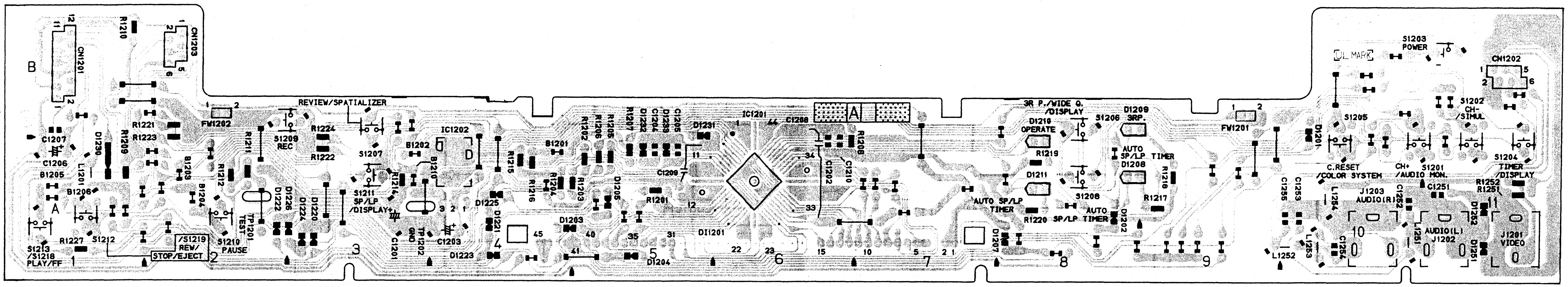

6
5
4
3
2
1
JOG/SHUTTLE UNIT
#UN1291 JOG/SHUTTLE PEME0786-02
TO SYSCON CN705(Page4-16)
# CN1205
NC
JSA
JSB
GND
SHUTTLE(L)
J2
C2
J1
# B1295
B1297 OPEN
B1298 OPEN
# S1216 PLAY
# S1214 INDEX- /TIMESCAN-
# S1215 INDEX+ /TIMESCAN+
# S1217 STOP/EJECT
# CN1204
# CN1203
S4
S3
KEY1
KEY2
KEY3
KEY4
37 JOG/SW
OPEN
VIDEO IN J1201 PEMC1009-04
AUDIO(L) IN J1202 OPEN
AUDIO(MONO) IN J1203 PEMC1010-03
R1251 75
R1252 0
C1252 SHORT
L1253 SHORT
L1251 OPEN
C1253 OPEN
C1254 560p
L1252 2.2μ
C1255 OPEN
D1251 1N4148M
D1252 1N4148M
C1251 OPEN
L1254 3.3μ
CN1202
GND
F. AUDIO(L)
GND (AUDIO)
F. AUDIO
GND (VIDEO)
FRONT_VIDEO
D1226 OPEN
D1225 OPEN
D1224 OPEN
D1223 OPEN
B1213 OPEN
D1222 OPEN
D1221 OPEN
# D1220 1N4148M
# B1205
# S1213/S1218 PLAY FF
B1215 OPEN
B1219 OPEN
# B1206
# S1212/S1219 STOP/EJECT REW
B1221
# B1204
# B1203 OPEN
# B1222
B1223 OPEN
B1224
S1209 REC
S1210 PAUSE
S1211 SP/LP
S1205 COLOUR SYSTEM
# S1206 3R PICTURE
S1207 REVIEW
# S1208 AUTO SP/LP TIMER
B1214
# B1217
B1216
B1220
B1218 OPEN
S1201 CH+
S1202 CH-
S1203 POWER
S1204 TIMER
R1221 33k
R1222 33k
R1223 33k
R1224 33k
D1205 SHORT
D1204 1N4148M
D1203 1N4148M
D1202 1N4148M
D1201 1N4148M
R1201 10k
R1202 10k
R1203 10k
R1204 10k
D1230 1ES2 (10mA)
L1201 330μ
IC1201 UPD16312GB(P)
C1202 0.1
C1201 47/16
C1205 330
D1231 OPEN
D1232 OPEN
D1233 OPEN
C1204 470
C1208 OPEN
C1209 OPEN
C1210 OPEN
R1205 4.7k
R1206 1k
R1207 470
R1209 10k
R1215 OPEN
R1216 OPEN
R1212 4.7k
R1211 10k
R1227 SHORT
C1203 220 /6.3
TP1201 TEST
IC1202 GP1U281X
B1202
B1201
B1210
R1214 OPEN
R1208 56k
TP1202 GND
D1208 # AUTO SP/LP TIMER
D1209 # 3R PICTURE
R1217 #
R1218 #
D1208 SLR-342MC3F
D1209 SLR-342DC3F
B1211 OPEN
D1210 OPEN
R1219 OPEN
B1212 OPEN
D1211 OPEN
R1220 OPEN
R1210 10k
C1207 0.001
C1206 10/50
D1207 RD9.1ES-T1B2
DI1201 (Ef=3.5VDC)
TO SYSCON CN802(Page4-16)
CN1201
CASS SW
REC SAFETY
AL5V
S.CLK
S.DATA
STB
B.UP GND
GND(C)
RC IN
DC(-)
DC(+)
-28V
FW1202 FW1202 CASS SW GND
S1242 PU61320 CASS
33 CASS SW
FW1201 FW1201 REC SAFETY GND
S1241 PESW0589 REC SAFE
32 REC SAFETY
28 DISPLAY

NOTE : COMPARISON CHART
OF MODELS & MARKS(#).

REF. No	MODELS	
	HR-J245EK	HR-J249EK
D1208, D1209	NOT USED	USED
R1217, R1218	OPEN	330
D1220	NOT USED	USED
S1206	NOT USED	USED
S1208	NOT USED	USED
S1212/S1219	S1219(REW)	S1212(STOP/EJECT)
S1213/S1218	S1218(FF)	S1213(PLAY)
S1214	USED	NOT USED
S1215	USED	NOT USED
S1216	USED	NOT USED
S1217	USED	NOT USED
UN1291	NOT USED	USED
B1203	SHORT	OPEN
B1204	OPEN	SHORT
B1205	OPEN	SHORT
B1206	SHORT	OPEN
B1217	OPEN	SHORT
B1222	OPEN	SHORT
B1295	OPEN	SHORT
CN1203, CN1204	USED	NOT USED
CN1205	NOT USED	USED

4.13 DISPLAY,REC SAFETY,CASSETTE SW AND JOG/SW CIRCUIT BOARDS

— DISPLAY —

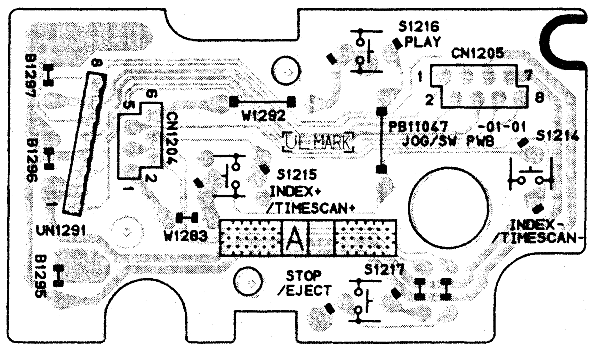


B
A
CN1201
CN1203
R1210
R1221
R1223
R1209
FW1202
C1207
C1206
B1205
B1206
D1230
L1201
R1227
S1212
S1213
/S1218
PLAY/FF
/S1219
REW/
STOP/EJECT
S1210
PAUSE
TP1201
TEST
REVIEW/SPATIALIZER
S1209
REC
R1224
R1222
S1207
IC1202
B1202
S1211
SP/LP
/DISPLAY
C1201
TP1202
GND
C1203
D1223
D1225
D1221
D1222
D1226
D1224
D1220
R1211
R1212
B1203
B1204
B1201
R1215
R1216
R1214
R1204
R1203
R1202
R1206
R1207
D1232
D1233
C1205
C1204
D1231
D1203
D1205
C1209
R1201
D1204
DI1201
IC1201
C1208
R1208
C1202
C1210
3R P./WIDE Q.
/DISPLAY
D1210
OPERATE
S1206 3RP.
D1209
R1219
D1211
AUTO
SP/LP TIMER
D1208
S1208
AUTO SP/LP
TIMER
R1220 SP/LP TIMER
AUTO
D1202
R1218
R1217
D1207
FW1201
D1201
S1203
POWER
UL MARK
CN1202
S1202
CH-
/SIMUL
S1205
S1204
TIMER
/DISPLAY
C.RESET
/COLOR SYSTEM
CH+
/AUDIO MON.
S1201
C1251
R1252
R1251
J1203
AUDIO(R)
D1252
C1255
L1254
C1253
L1253
C1254
L1251
AUDIO(L)
J1202
D1251
J1201
VIDEO
L1252
1
2
3
4
5
6
7
8
9
10
11

COMPONENT PARTS LOCATION GUIDE < DISPLAY >

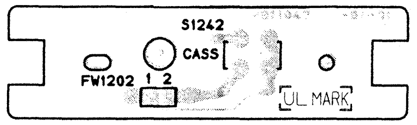
REF.NO.	LOCATION		
CAPACITOR			
C1201	A	D	3A
C1202	A	D	6A
C1203	A	D	4A
C1204	A	D	5B
C1205	A	D	5B
C1206	A	D	1A
C1207	A	D	1B
C1208	A	D	6A
C1209	A	D	5A
C1210	A	D	6A
C1251	A	D	11A
C1252	A	D	10A
C1253	A	D	10A
C1254	A	D	10A
C1255	A	D	10A
CONNECTOR			
CN1201	A	D	1B
CN1202	A	D	11B
CN1203	A	D	2B
DIODE			
D1201	A	D	10A
D1202	A	D	8A
D1203	A	D	5A
D1204	A	D	5A
D1205	A	D	5A
D1207	A	D	8A
D1208	A	D	8A
D1209	A	D	8B
D1210	A	D	8A
D1211	A	D	8A
D1220	A	D	3A
D1221	A	D	4A
D1222	A	D	2A
D1223	A	D	4A
D1224	A	D	3A
D1225	A	D	4A
D1226	A	D	3A
D1230	A	D	1B
D1231	A	D	6B
D1232	A	D	5B
D1233	A	D	5B
D1251	A	D	11A
D1252	A	D	11A
IC			
IC1201	B	C	6A
IC1202	A	D	4A
COIL			
L1201	A	D	1A
L1251	A	D	10A
L1252	A	D	10A
L1253	A	D	10A
L1254	A	D	10A
RESISTOR			
R1201	A	D	5A
R1202	A	D	5A
R1203	A	D	5A
R1204	A	D	4A
R1205	A	D	5A
R1206	A	D	5A
R1207	A	D	5A
R1208	A	D	6B
R1209	A	D	1A
R1210	A	D	1B
R1211	A	D	2A
R1212	A	D	2A
R1214	A	D	3A
R1215	A	D	4A
R1216	A	D	4A
R1217	A	D	9A
R1218	A	D	9A
R1219	A	D	8A
R1220	A	D	8A
R1221	A	D	2B
R1222	A	D	3A
R1223	A	D	2B
R1224	A	D	3B
R1227	A	D	1A
R1251	A	D	11A
R1252	A	D	11A
SWITCH			
S1201	A	D	10A
S1202	A	D	11A
S1203	A	D	11B
S1204	A	D	11A
S1205	A	D	10A
S1206	A	D	8B
S1207	A	D	3B
S1208	A	D	8A
S1209	A	D	3B
S1210	A	D	2A
S1211	A	D	3A
S1212	A	D	1A
S1213	A	D	1A
TEST POINT			
TP1201	A	D	2A
TP1202	A	D	3A
OTHER			
DI1201	A	D	6A
J1201	A	D	11A
J1202	A	D	11A
J1203	A	D	10A

— JOG/SW —



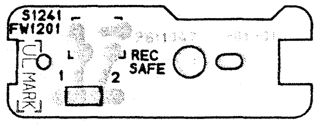
S1216
PLAY
CN1205
B1297
B1296
B1295
CN1204
W1292
UL MARK
PB11047 -01-01
JOG/SW PWB
S1214
S1215
INDEX+
/TIMESCAN+
INDEX-
/TIMESCAN-
UN1291
W1283
A
STOP
/EJECT
S1217

— CASSETTE SW —



S1242
CASS
FW1202
UL MARK

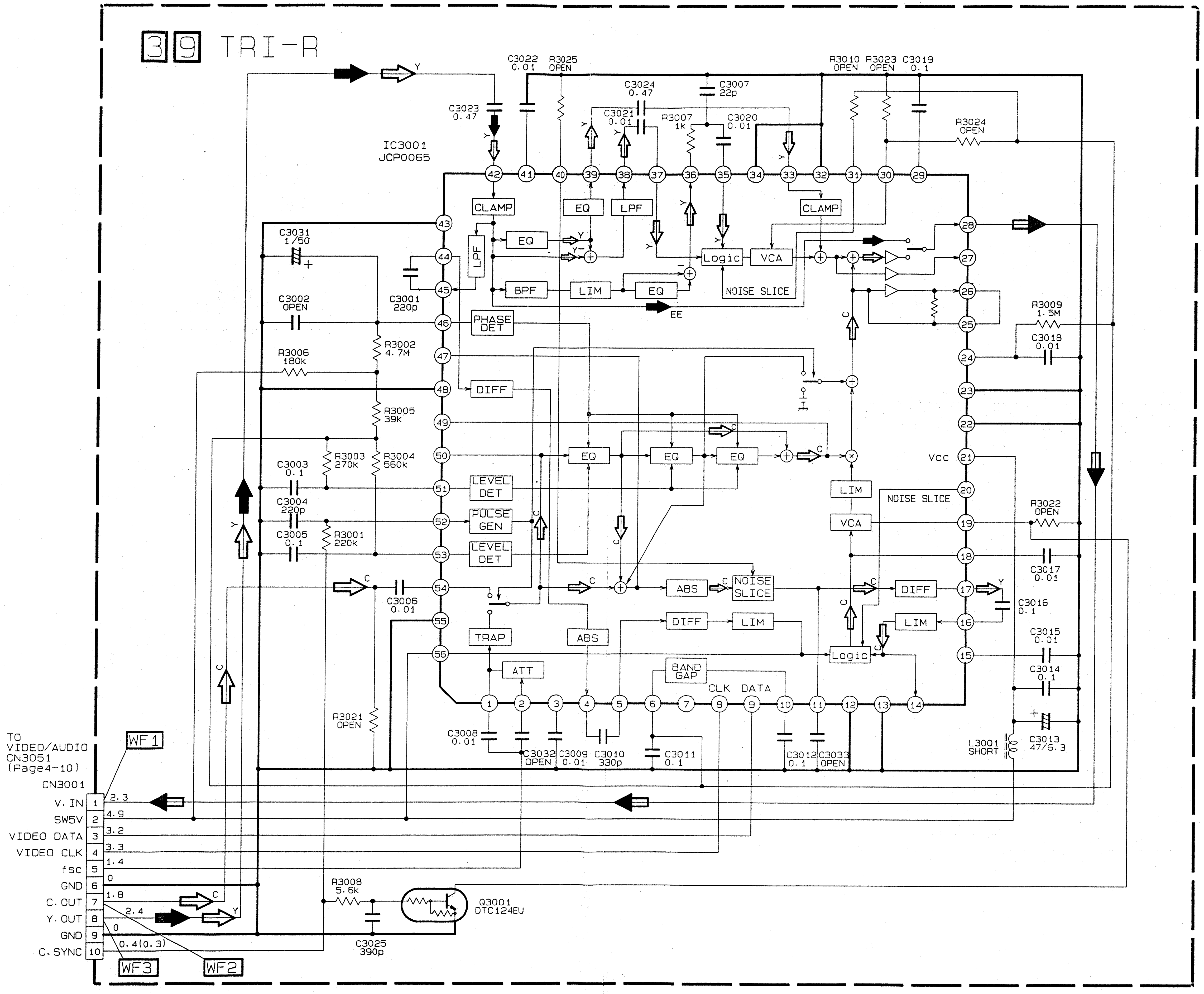
— REC SAFETY —



S1241
FW1201
UL MARK
REC
SAFE

4.14 TRI-R SCHEMATIC DIAGRAM

— HR-J249EK —

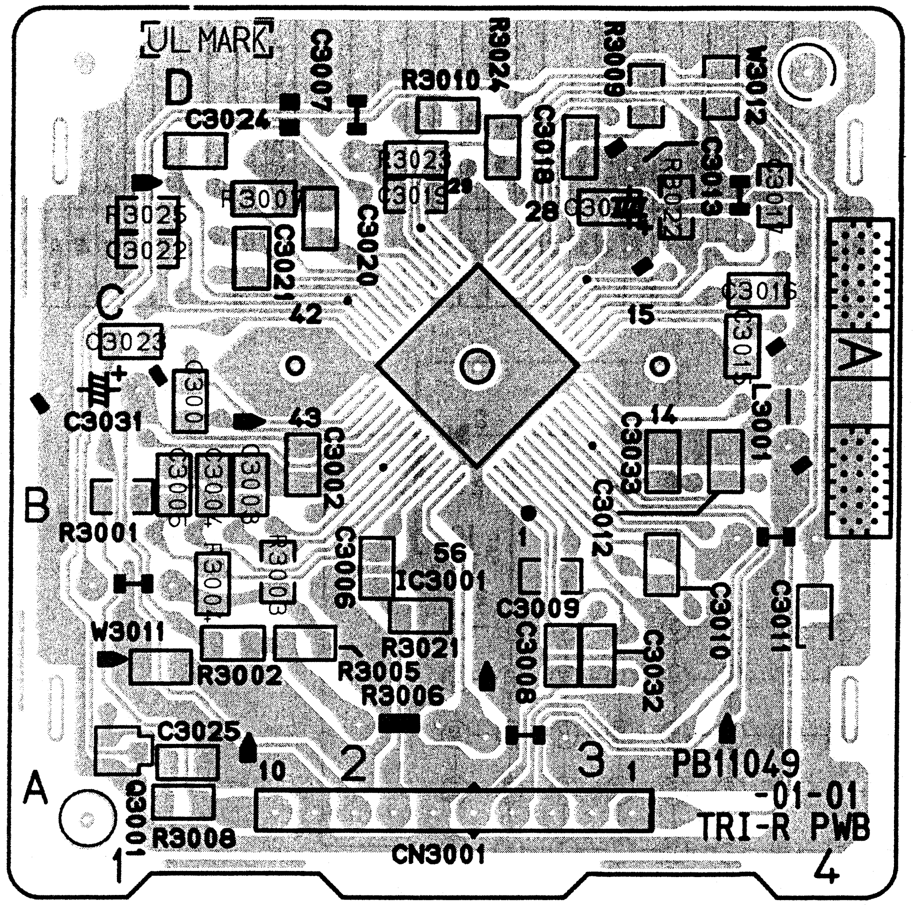


39 TRI-R
IC3001
JCP0065
C3022 0.01
R3025 OPEN
C3023 0.47
C3024 0.47
C3021 0.01
C3007 22p
R3007 1k
C3020 0.01
R3010 OPEN
R3023 OPEN
C3019 0.1
R3024 OPEN
CLAMP
EQ
LPF
Logic
VCA
NOISE SLICE
BPF
LIM
EE
C3031 1/50
C3001 220p
C3002 OPEN
PHASE DET
R3002 4.7M
R3006 180k
DIFF
R3005 39k
C3003 0.1
R3003 270k
R3004 560k
LEVEL DET
C3004 220p
PULSE GEN
C3005 0.1
R3001 220k
C3006 0.01
TRAP
ABS
ATT
BAND GAP
CLK
DATA
R3021 OPEN
C3008 0.01
C3032 OPEN
C3009 0.01
C3010 330p
C3011 0.1
C3012 0.1
C3033 OPEN
Vcc
R3009 1.5M
C3018 0.01
R3022 OPEN
C3017 0.01
C3016 0.1
C3015 0.01
C3014 0.1
C3013 47/6.3
L3001 SHORT
TO VIDEO/AUDIO CN3051 (Page4-10)
CN3001
V. IN
SW5V
VIDEO DATA
VIDEO CLK
fsc
GND
C. OUT
Y. OUT
GND
C. SYNC
2.3
4.9
3.2
3.3
1.4
0
1.8
2.4
0
0.4(0.3)
WF1
WF2
WF3
R3008 5.6k
C3025 390p
Q3001 DTC124EU
Y
C

NOTE : For TRI-R waveform, please refer to page4-33.

4.15 TRI-R CIRCUIT BOARD

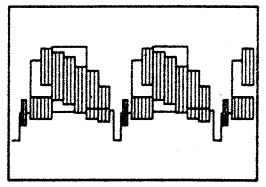
— HR-J249EK —


UL MARK
D
C
B
A
1
2
3
4
C3024
C3007
R3010
R3024
R3009
W3012
R3023
C3019
C3018
C3013
C3025
C3022
C3023
C3020
C3021
C3015
C3016
C3017
C3031
C3003
C3004
C3005
R3001
R3003
R3004
C3002
C3006
C3033
C3012
L3001
C3009
C3008
C3032
C3010
C3011
R3021
R3005
R3006
IC3001
W3011
R3002
R3008
C3001
CN3001
PB11049
-01-01
TRI-R PWB
28
42
43
14
15
56
1
10

WAVEFORMS

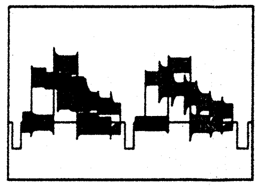
— TRI-R —

WF1 V.OUT CN3001-1



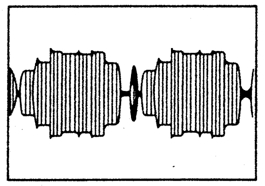
PAL REC/PB 2.18 Vp-p
0.1 V/20 µsec/DIV

WF1 V.OUT CN3001-1



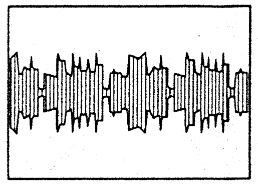
SECAM REC/PB 2.47 Vp-p
0.1 V/20 µsec/DIV

WF2 C.IN CN3001-7



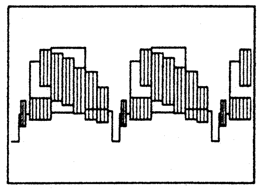
PAL PB 0.5 Vp-p
20 mV/20 µsec/DIV

WF2 C.IN CN3001-7



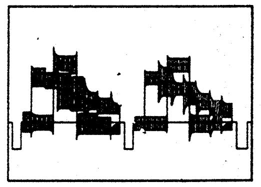
SECAM PB 0.5 Vp-p
20 mV/20 µsec/DIV

WF3 Y.IN CN3001-8



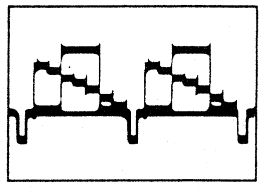
PAL REC 2.25 Vp-p
0.1 V/20 µsec/DIV

WF3 Y.IN CN3001-8



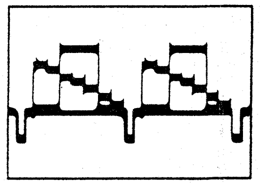
SECAM REC 2.24 Vp-p
0.1 V/20 µsec/DIV

WF3 Y.IN CN3001-8



PAL PB 2.25 Vp-p
0.1 V/20 µsec/DIV

WF3 Y.IN CN3001-8



SECAM PB 2.21 Vp-p
0.1 V/20 µsec/DIV

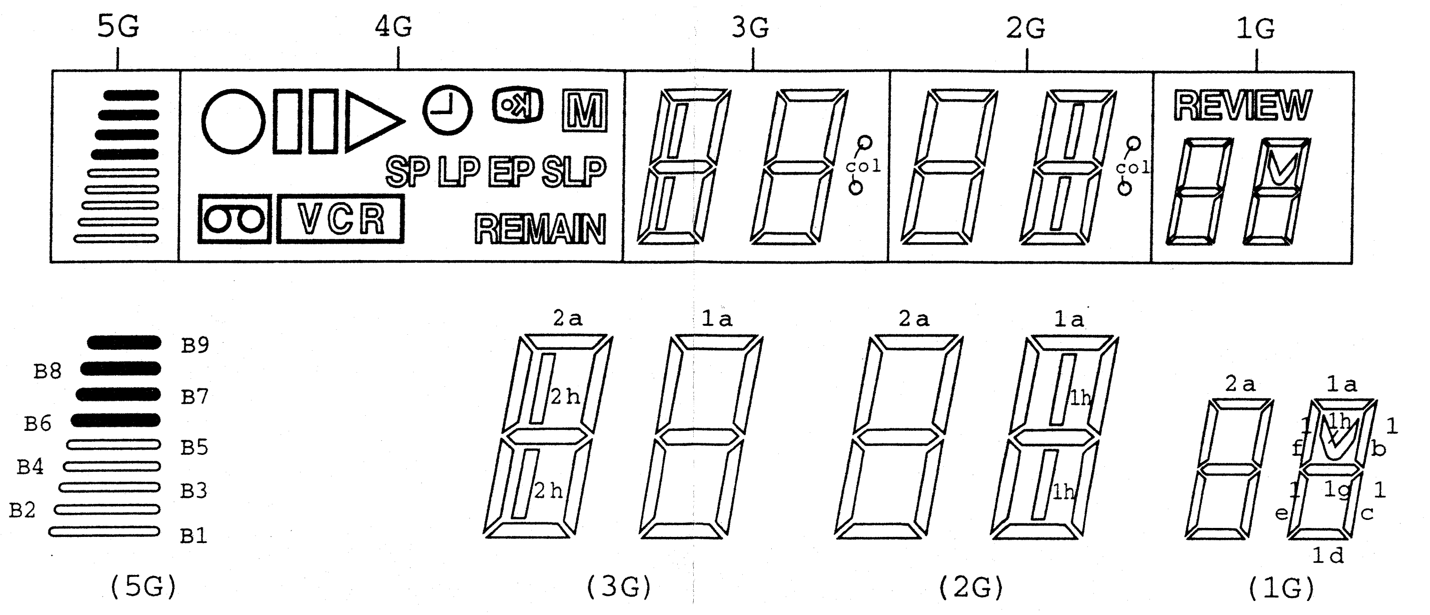
COMPONENT PARTS LOCATION GUIDE < TRI-R >

REF.NO.	LOCATION		
CAPACITOR			
C3001	B	C	1C
C3002	B	C	2B
C3003	B	C	2B
C3004	B	C	1B
C3005	B	C	1B
C3006	B	C	2B
C3007	A	D	2D
C3008	B	C	3B
C3009	B	C	3B
C3010	B	C	3B
C3011	B	C	4B
C3012	B	C	4B
C3013	A	D	3C
C3014	B	C	3C
C3015	B	C	4C
C3016	B	C	4C
C3017	B	C	4C
C3018	B	C	3D
C3019	B	C	2C
C3020	B	C	2C
C3021	B	C	2C
C3022	B	C	1C
C3023	B	C	1C
C3024	B	C	1D
C3025	B	C	1A
C3031	A	D	1C
C3032	B	C	3B
C3033	B	C	3B

REF.NO.	LOCATION		
CONNECTOR			
CN3001	A	D	3A
IC			
IC3001	B	C	2C
COIL			
L3001	A	D	4B
TRANSISTOR			
Q3001	B	C	1A
RESISTOR			
R3001	B	C	1B
R3002	B	C	1B
R3003	B	C	2B
R3004	B	C	1B
R3005	B	C	2B
R3006	A	D	2A
R3007	B	C	2C
R3008	B	C	1A
R3009	B	C	3D
R3010	B	C	2D
R3021	B	C	2B
R3022	B	C	3C
R3023	B	C	2D
R3024	B	C	3D
R3025	B	C	1C

4.16 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT


5G
4G
3G
2G
1G
SP LP EP SLP
VCR
REMAIN
REVIEW
col
B9
B8
B7
B6
B5
B4
B3
B2
B1
2a
1a
2h
1h
f
b
1g
e
c
1d
1
(5G)
(3G)
(2G)
(1G)

ANODE CONNECTION

	5G	4G	3G	2G	1G
P1		○	1a	1a	1a
P2		▯▯	1b	1b	1b
P3		▷	1f	1f	1f
P4		◷	1g	1g	1g
P5		OK	1c	1c	1c
P6		M	1e	1e	1e
P7		OO	1d	1d	1d
P8	B9	VCR	col	1h	1h
P9	B8	SP	2a	2a	2a
P10	B7	LP	2b	2b	2b
P11	B6	EP	2f	2f	2f
P12	B5	SLP	2g	2g	2g
P13	B4	REMAIN	2c	2c	2c
P14	B3		2e	2e	2e
P15	B2		2d	2d	2d
P16	B1		2h	col	REVIEW

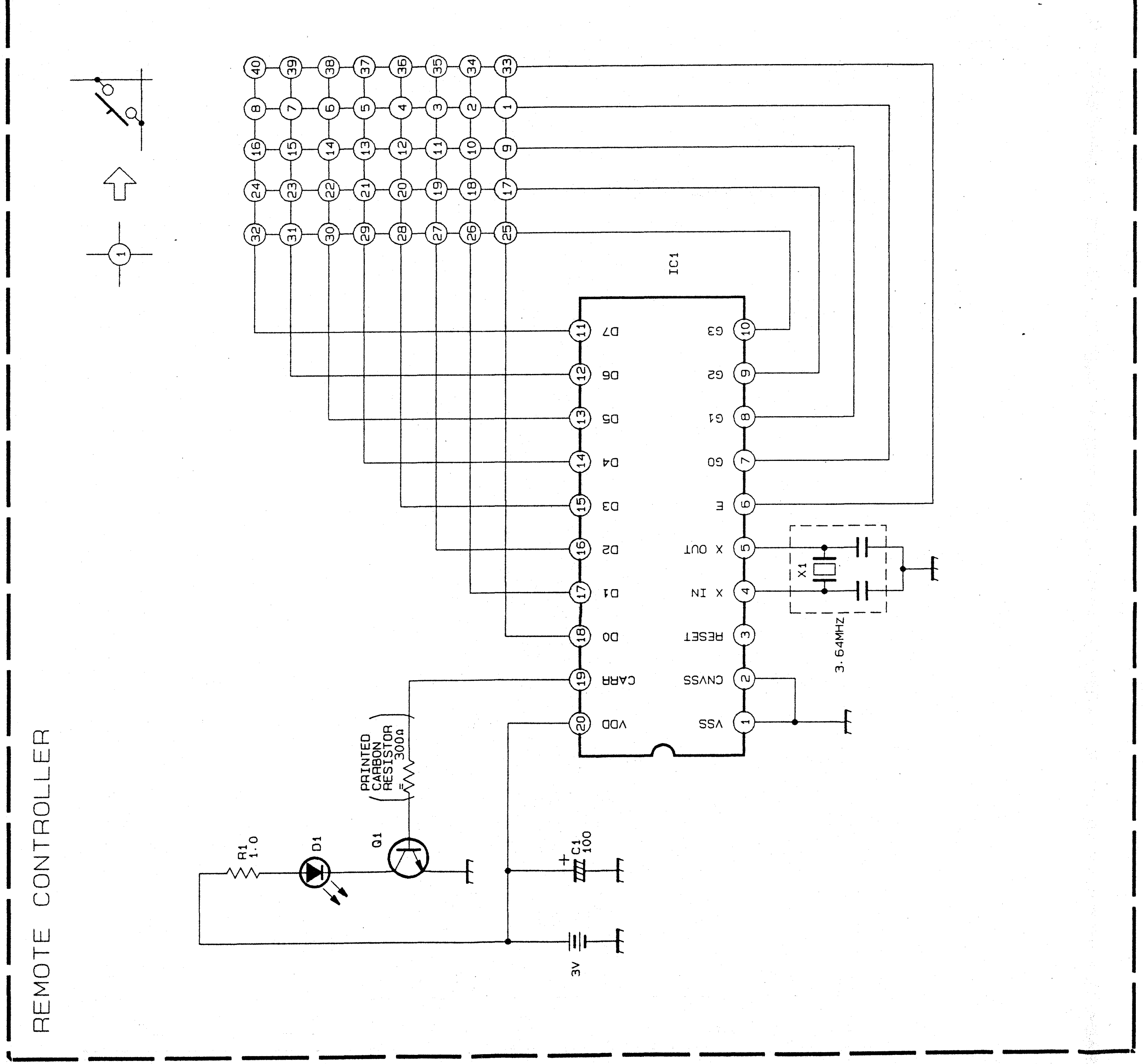
4.17 REMOTE CONTROL SCHEMATIC DIAGRAM

— HR-J245EK —

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	TV
2	DISPLAY
3	TV/VCR
4	OPERATE
5	1
6	2
7	3
8	RE-VIEW
9	4
10	5
11	6
12	AUDIO MONITOR
13	7
14	8
15	9
16	CANCEL
17	PRG CHECK
18	0
19	-/--
20	TIMER
21	START +
22	STOP +
23	DATE +
24	TV PROG +
25	START -
26	STOP -
27	DATE -
28	TV PROG -
29	REW
30	PLAY
31	FF
32	REC
33	STOP
34	PAUSE
35	PROG/MENU
36	OK
37	PUSH JOG <<
38	CURSOR +/TV VOL +
39	PUSH JOG >>
40	SURSOR -/TV VOL -
32+30	REC START
32+34	REC PAUSE
1+3	TV TV/VCR
1+4	TV OPERATE
1+12	TV MUTE
1+19	TV MAIN/SUB
1+24	TV PRG+
1+28	TV PRG-
1+38	TV VOL+
1+40	TV VOL-

BZ013869-01



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23
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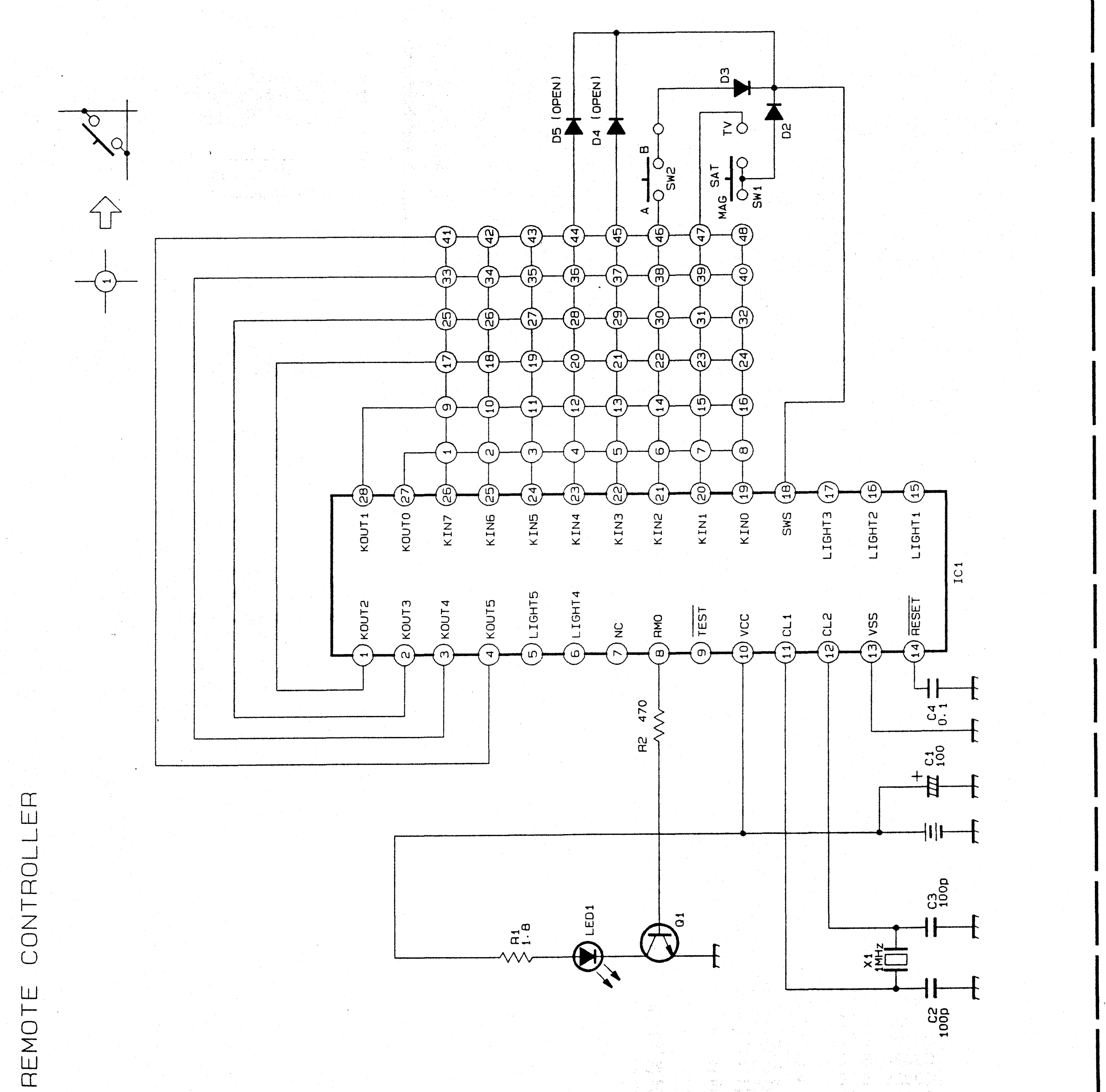
21
20
19
18
17
32
31
30
29
28
27
26
25
1
IC1
D7
D6
D5
D4
D3
D2
D1
D0
CARR
VDD
G3
G2
G1
G0
E
X OUT
X IN
RESET
CNVSS
VSS
X1
3.64MHz
PRINTED CARBON RESISTOR 300Ω
Q1
D1
R1 1.0
C1 100
3V
REMOTE CONTROLLER

— HR-J249EK —

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	PUSH JOG >>
2	-
3	R.A.EDIT
4	SCENE FINDER
5	PRG CHECK
6	7
7	8
8	9
9	ILLUMI GUIDE
10	TV PROG +
11	CURSOR +/TV VOL +
12	PROG/MENU
13	OK
14	CANCEL
15	0
16	TIMER
17	OPERATE
18	-
19	AUDIO MONITOR
20	-/--
21	TV/VCR
22	RE_VIEW
23	CH SEARCH
24	CH STORE
25	STOP -
26	DATE +
27	DATE -
28	START -
29	TV PROG -
30	C.MEMORY
31	DISPLAY
32	SPATIALIZER
33	START +
34	PUSH JOG >>
35	PLAY
36	REW
37	FF
38	1
39	2
40	3
41	CURSOR -/TV VOL -
42	STOP +
43	STOP
44	REC
45	PAUSE
46	4
47	5
48	6
44+35	REC START
44+45	REC PAUSE

PEAC0505



D5 (OPEN)
D4 (OPEN)
D3
D2
B
A
SW2
TV
SAT
MAG
SW1
41
42
43
44
45
46
47
48
33
34
35
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24
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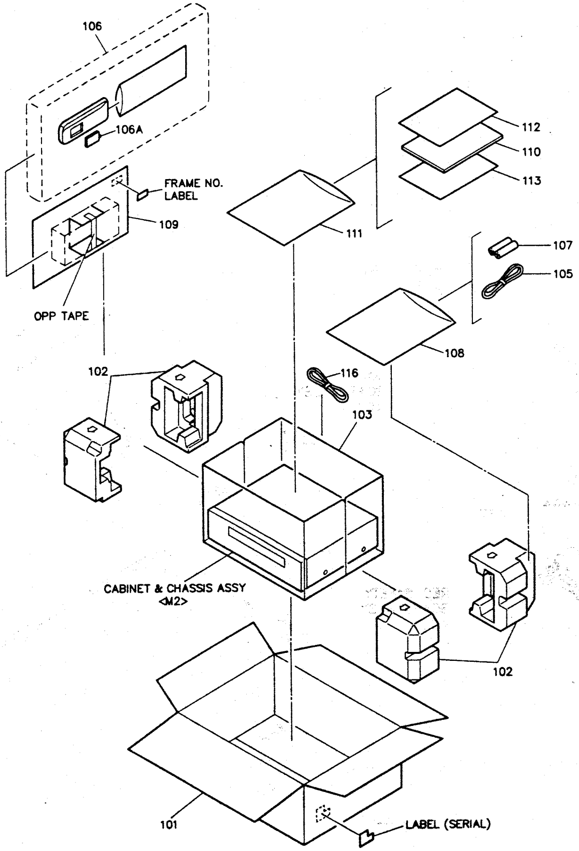
11
12
13
14
15
16
1
2
3
4
5
6
7
8
KOUT1
KOUT0
KIN7
KIN6
KIN5
KIN4
KIN3
KIN2
KIN1
KIN0
SWS
LIGHT3
LIGHT2
LIGHT1
IC1
KOUT2
KOUT3
KOUT4
KOUT5
LIGHT5
LIGHT4
NC
RMO
TEST
VCC
CL1
CL2
VSS
RESET
R2 470
C4 0.1
C1 100
C3 100P
X1 1MHz
C2 100P
R1 1.8
LED1
Q1
REMOTE CONTROLLER

SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>


106
106A
FRAME NO. LABEL
109
OPP TAPE
112
110
113
111
107
105
108
102
116
103
CABINET & CHASSIS ASSY <M2>
102
101
LABEL (SERIAL)

****

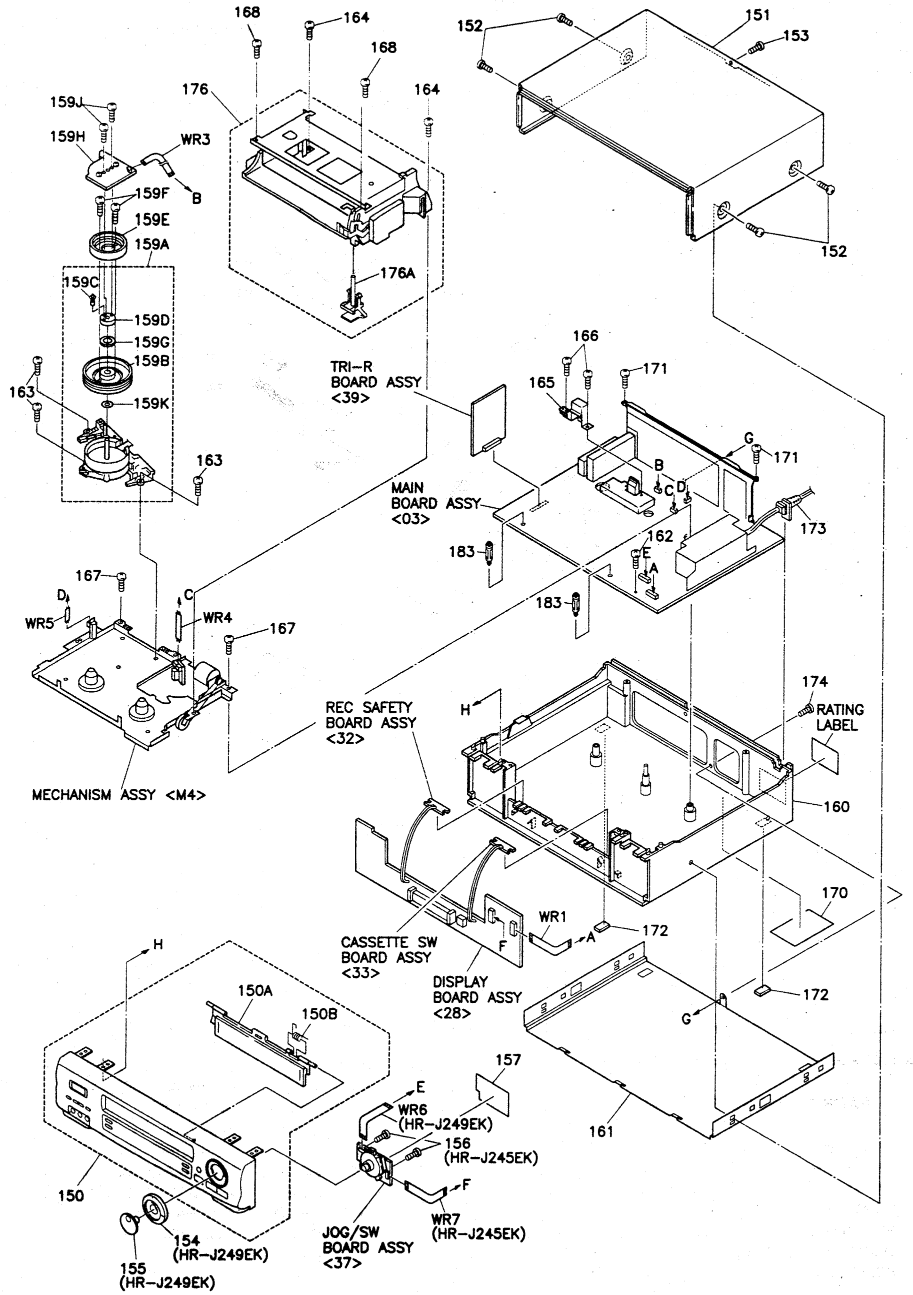
PACKING ASSEMBLY <M1>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	101	LP30155-007A	PACKING CASE,J245EK
		LP30155-009A	PACKING CASE,J249EK
	102	LP30124-001A	CUSHION ASSEMBLY
	103	PQM30021-93	POLY BAG
	105	PEAC0300-02	RF CABLE
	106	*LP20106-002B*	*REMOTE CONTROLLER,J245EK*
		PQ21953U	REMOTE CONTROLLER,J249EK
	106A	LP40074-001A	BATTERY CASE,J245EK
		PQ46614	COVER(BATTERY),J249EK
	107	R6PRPA-2ST	BATTERY,X2
	108	QPC02202215P	POLY BAG
	109	PQ35575-1-1	SHEET,REMOTE CONTROLLER
⚠	110	LPT0002-055A	INST BOOK(ENGLISH),J245EK
⚠		LPT0002-056A	INST BOOK(ENGLISH),J249EK
	111	QPC02503515P	POLY BAG
	112	BT-54003-1	GUARANTY CARD
	113	*BT-20066A*	*E.DISTRI.LIST*

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

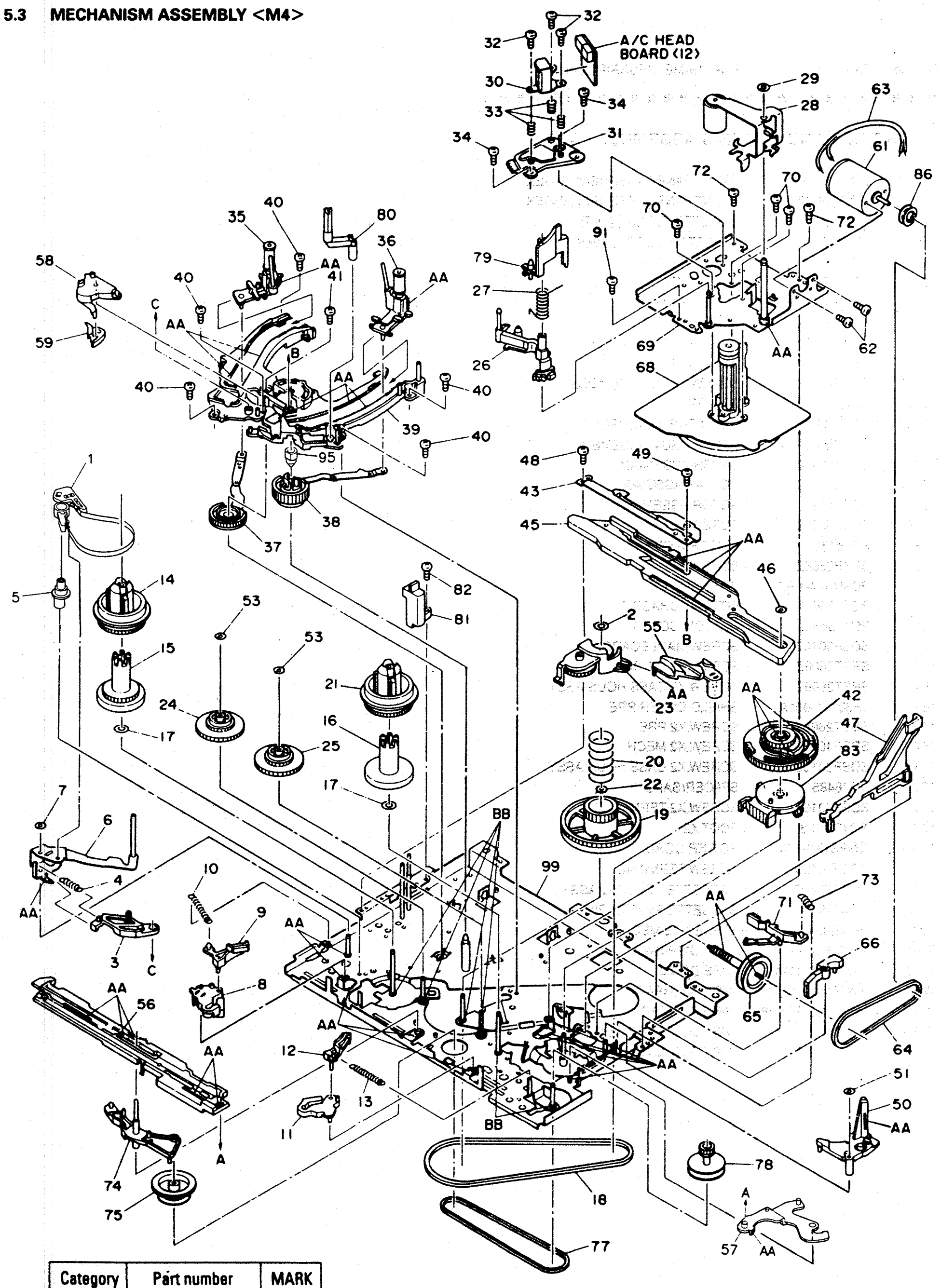

168
164
168
164
176
152
151
153
159J
159H
WR3
B
159F
159E
159A
176A
159C
159D
159G
159B
159K
163
163
152
166
171
TRI–R
BOARD ASSY
<39>
165
G
171
B
C
D
173
MAIN
BOARD ASSY
<03>
162
E
A
183
183
167
D
C
WR5
WR4
167
MECHANISM ASSY <M4>
REC SAFETY
BOARD ASSY
<32>
H
174
RATING
LABEL
160
170
WR1
A
172
CASSETTE SW
BOARD ASSY
<33>
F
DISPLAY
BOARD ASSY
<28>
172
H
150A
150B
G
157
E
WR6
(HR–J249EK)
156
(HR–J245EK)
161
F
150
154
(HR–J249EK)
155
(HR–J249EK)
WR7
(HR–J245EK)
JOG/SW
BOARD ASSY
<37>

****

CABINET AND CHASSIS ASSEMBLY <M2>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	150	LP10018-005A	FRONT PANEL ASSEMBLY,J245EK
		LP10018-006A	FRONT PANEL ASSEMBLY,J249EK
	150A	PQ21884-41	CASSETTE DOOR,J245EK
		PQ21884-42	CASSETTE DOOR,J249EK
	150B	PQ46448	TORSION SPRING
⚠	151	PQ11676-7	TOP COVER
	152	SDSF3010M	SCREW,X4 (SIDE)
	153	SDSF3010M	SCREW, (REAR)
	154	LP30120-001A	KNOB SHUTTLE,J249EK
	155	LP30121-001A	KNOB JOG,J249EK
	156	SDSF2608Z	SCREW,X2 JOG/SW,J425EK
	157	LP40141-001A	SPACER
	159A	LP20083-003A	DRUM SUB ASSEMBLY
	159B	LP20084-003A	UPPER DRUM ASSEMBLY
	159C	LP40025-001A	BRUSH ASSEMBLY
	159D	LP40028-001A	COLLAR ASSEMBLY
	159E	PDZ0179	ROTOR ASSEMBLY
	159F	SPSP3006Z	SCREW,X2
	159H	PDZ0181	STATOR ASSEMBLY
	159J	SPSP2606Z	SCREW,X2
	159K	PDM4444-19-2	WASHER
⚠	160	PQ11666-3-14	BOTTOM CHASSIS
⚠	161	PQ11668-2	BOTTOM COVER
	162	SDSF3010Z	SCREW,MAIN BOARD
	163	SPST2608Z	SCREW,X3 DRUM
	164	SPST2606Z	SCREW,X2 CASS HOUS ASSY
	165	LP30131-001A	SHIELD COVER,PRE
	166	SDST2606Z	SCREW,X2 PRE
	167	SDSF4012Z	SCREW,X2 MECH
	168	SDSF3010Z	SCREW,X2 CASS HOUS ASSY
⚠	170	PQ46485	SPACER(SAFETY)
	171	SDSF3010Z	SCREW,X2 TERMINAL
	172	PQ43013-3	FOOT,X2
⚠	173	QMP51K0-170	POWER CORD
	174	SDSF3010M	SCREW,TERMINAL
	176	PUS29724E	CASSETTE HOUSING ASSY
	176A	PQ46359-1-1	CASSETTE SWITCH PIN
	183	PEME0947-01-01	SPACER,X2 MECH
	WR1	PW30802-1214	WIRE,DISP/SW
	WR3	PW30803-0414	WIRE,DRUM
	WR4	PW30101-C0HH887	WIRE,A/C HEAD
	WR5	PW30101-P0HH882	WIRE,FE HEAD
	WR6	PW30802-0614	WIRE,JOG/SW J245EK
	WR7	PW30802-0818	WIRE,JOG J249EK

5.3 MECHANISM ASSEMBLY <M4>



Category	Part number	MARK
Grease	KYODO-SH-P	AA
Oil	*COSMO-HV56*	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

#⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	LP40006-001B	TENSION BAND ASSEMBLY
2	PQM30017-34	SLIT WASHER
3	PQ35012-1-5	TENSION ARM LEVER
4	PQM30001-385109	TENSION SPRING
5	LP30103-001A	ADJUST PIN
6	PQ46303A-8	TENSION ARM ASSEMBLY
7	PQM30017-47	SLIT WASHER
8	PQ46305B-3	MAIN BRAKE ASSEMBLY (SUPPLY)
9	PQ46306A-6	SUB BRAKE ASSEMBLY (SUPPLY)
10	PQM30001-393	TENSION SPRING
11	PQ46308A-5	MAIN BRAKE ASSEMBLY (TAKE UP)
12	PQ46309A-4	SUB BRAKE ASSEMBLY (TAKE UP)
13	PQM30001-389102	TENSION SPRING
14	PQ46551B	REEL DISK ASSEMBLY (SUPPLY)
15	PQ35436	SLIT DISK (SUPPLY)
16	PQ35437	SLIT DISK (TAKE UP)
17	PQM30018-79	SPACER,X2
18	PQM30003-38	BELT (CAPSTAN)
19	PQ46497B-2	PULLEY
20	PQM30002-233	COMPRESSION SPRING
21	PQ46562B	REEL ASSEMBLY (TAKE UP)
22	PQM30018-69	SPACER
23	PQ46312C-15	IDLER ARM ASSEMBLY
24	PQ46316C-6	CLUTCH UNIT (SUPPLY)
25	PQ46323A-1	CLUTCH UNIT (TAKE UP)
26	PQ46325C-9	GUIDE ARM ASSEMBLY
27	PQ46326-2	TORSION SPRING
28	PQ46327A-3	PINCH ROLLER ARM ASSEMBLY
29	PQM30017-24	SLIT WASHER,P LEVER
30	PEHE0182	AUDIO CONTROL HEAD
31	PQ35206-1-3	HEAD BASE
32	PQ43687A	SCREW,X3
33	PQM30002-192	COMPRESSION SPRING,X3
34	SDSP2604Z	SCREW,X2
35	PQ46595B-5	POLE BASE ASSEMBLY (SUPPLY)
36	PQ46331C	POLE BASE ASSEMNLY (TAKE UP)
37	PQ46332B-3	LOADING ARM ASSEMBLY (SUPPLY)
38	PQ46337C	LOADING ARM ASSEMBLY (TAKE UP)
39	PQ11657-1-9	GUIDE RAIL
40	SPST2608Z	SCREW,X5
41	SDST2612Z	SCREW
42	LP20003-001A	CONTROL CAM
43	PQ35138-1-2	CONTROL BRACKET
45	LP10004-001B	CONTROL PLATE
46	PQM30017-8	SLIT WASHER
47	PQ21685-2-10	PINCH PLATE
48	SPST2606Z	SCREW
49	SPSF2608M	SCREW
50	PQ46342D-10	LEVER ASSEMBLY
51	PQM30017-8	SLIT WASHER
53	PQM30017-47	SLIT WASHER,X2
55	PQ35026-1-7	IDLER LEVER
56	PQ11659-1-12	SLIDE PLATE
57	LP40014-001A	CHANGE LEVER ASSEMBLY
58	PQ21686-1-3	TAKE UP LEVER
59	PQ46345-1-2	TAKE UP HEAD
⚠ 61	PU60628-3-2	LOADING MOTOR
62	SPSP3003Z	SCREW,X2
63	PW30101-80AJ632	WIRE
64	LP30005-002A	BELT
65	PQ46395B	WORM GEAR ASSEMBLY
66	PQ21699-1-2	WORM BEARING
⚠ 68	PU61487-2-3	CAPSTAN MOTOR
69	PQ46347D	SUB DECK ASSEMBLY
70	SPSG2608Z	SCREW,X3
71	PQ46356C-3	CAPSTAN BRAKE ASSEMBLY
72	SPST2606Z	SCREW,X2
73	PQM30001-384101	TENSION SPRING,CAPSTAN BRAKE
74	PQ46353A-2	CHANGE ARM ASSEMBLY
75	PQ46354	CHANGE GEAR
77	PQM30003-40	BELT
78	LP40008-001A	CASSETTE GEAR
79	PQ35030-1-5	LID GUIDE
80	LP20032-001A	LED PRISM
81	PEHE0237	FULL ERASE HEAD
82	SDST2610Z	SCREW
83	PU61432-1-1	ROTARY ENCODER
86	PQ43546-1-2	MOTOR PULLEY
91	SDSP2604Z	SCREW
95	PQ46767-1-2	GUIDE CAP
99	PQ21680L-23	MAIN DECK ASSEMBLY

5.4 ELECTRICAL PARTS LIST

* * *

MAIN BOARD ASSEMBLY <03>

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION	
PW1	PB11046D-01	MAIN BOARD ASSEMBLY,J249EK	
	PB11046E-01	MAIN BOARD ASSEMBLY,J245EK	
IC1	HA118203AF	IC	
IC2	MSM7470-79MS-XE	IC	
IC101	HA118295NT	IC	
IC202	TC74HC4052AP	IC	
IC701	HD6433929TA72F	QFP IC (MCU)	
IC702	24LC08B/P	IC	
	or X24C08-10P	IC	
	or AT24C08-10PC	IC	
IC703	S-80728AN	IC	
	or RE5VA28A	IC	
	or RE5VL28A	IC	
IC704	TA7291S	IC	
IC901	LA5613	IC	
IC1001	BA15218N	IC	
	or M5223L	IC	
IC1101	BU2885CS	IC	
	or BU2885BS	IC	
	or BU2884BS	IC	
IC1301	LC74795-9601	IC	
Q1	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q2	UN521E	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
Q9	UN511E	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or DTA144WU	TRANSISTOR	
Q15	2SB1218A(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
Q16	UN521E	TRANSISTOR	
	or RN1309	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
Q19	2SD1819A(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
Q21	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q101	2SD1819A(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
Q102	UN511E	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or DTA144WU	TRANSISTOR	
Q103	UN521E	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
	or RN2309	TRANSISTOR	
Q201	2SC1740S(QRS)	TRANSISTOR	
	or 2SC3199(YG)-TJK	TRANSISTOR	
Q202	2SB1218A(QR)	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q205	2SD1819A(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
Q258	2SB1218A(QR)	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q301	UN5211	TRANSISTOR	
	or DTC114EU	TRANSISTOR	
	or RN1302	TRANSISTOR	
Q302	UN511E	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or DTA144WU	TRANSISTOR	
Q303	UN5215	TRANSISTOR	
	or DTC114TU	TRANSISTOR	
Q304	UN511E	TRANSISTOR	
	or RN2309	TRANSISTOR	
	or DTA144WU	TRANSISTOR	
Q305	UN5111	TRANSISTOR	
	or RN2302	TRANSISTOR	
	or DTA114EU	TRANSISTOR	
Q306	2SD1819A(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
Q307	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q308	UN5211	TRANSISTOR	
	or RN1302	TRANSISTOR	
	or DTC114EU	TRANSISTOR	
Q309	2SB1218A(QR)	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q310	2SB1218A(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
Q311	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q701	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q703	UN5211	TRANSISTOR	
	or DTC114EU	TRANSISTOR	
	or RN1302	TRANSISTOR	
Q704	LP40038-001A	TAPE SENSOR	
Q705	LP40038-001A	TAPE SENSOR	
Q706	UN5211	TRANSISTOR	
	or RN1302	TRANSISTOR	
	or DTC114EU	TRANSISTOR	
Q711	2SD1819A(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
Q901	2SK2632-CB14	FE TRANSISTOR	
	or 2SK2666F04	FE TRANSISTOR	
	or 2SK2129-LT	FE TRANSISTOR	
Q902	2SD2144S(UV)	TRANSISTOR	
Q955	2SD2144S(UVW)	TRANSISTOR	
Q956	2SB1256	TRANSISTOR,J249EK	
Q957	UN5215	TRANSISTOR,J249EK	
	or DTC114TU	TRANSISTOR,J249EK	
Q1002	2SB810H,J	TRANSISTOR	
Q1003	2SC3068	TRANSISTOR	
Q1006	DTC114EU	TRANSISTOR	
Q1008	2SB1218A(RS)	TRANSISTOR	
	or 2SA1576(RS)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q1304	UN521E	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
Q1351	2SB1218A(QR)	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q1352	2SD1819A(QRS)	TRANSISTOR	
	or 2SC4081(QRS)	TRANSISTOR	
	or 2PC4081/R/-X	TRANSISTOR	
Q1401	2SB1218A(QR)	TRANSISTOR	
	or 2SA1576(QR)	TRANSISTOR	
	or 2PA1576/R/-X	TRANSISTOR	
Q1402	UN521E	TRANSISTOR	
	or DTC144WU	TRANSISTOR	
	or RN1309	TRANSISTOR	
D5	1N4148M	DIODE	
	or 1SS133	DIODE	
D8	1N4148M	DIODE	
	or 1SS133	DIODE	
D10	1N4148M	DIODE	
	or 1SS133	DIODE	
D12	1N4148M	DIODE	
	or 1SS133	DIODE	
D201	MTZ12AT-77	ZENER DIODE	
D254	1N4148M	DIODE	
	or 1SS133	DIODE	
D301	1N4148M	DIODE	
	or 1SS133	DIODE	
D701	RD9.1ES-T1B2	ZENER DIODE	
	or MTZJ9.1(B)	ZENER DIODE	
D702	11ES2	DIODE	
D703	1N4148M	DIODE	
	or 1SS133	DIODE	
D704	11ES2	DIODE	
D705	1N4148M	DIODE	
	or 1SS133	DIODE	
D706	1N4148M	DIODE	
	or 1SS133	DIODE	
D710	SIR-381SB3FM	LE DIODE	
	or SIR-381SB3FX1M	LE DIODE	
D712	1N4148M	DIODE,J249EK	
	or 1SS133	DIODE,J249EK	
D713	1N4148M	DIODE,J249EK	
	or 1SS133	DIODE,J249EK	
D714	1N4148M	DIODE	
	or 1SS133	DIODE	
D715	1N4148M	DIODE	
	or 1SS133	DIODE	
D901	S1WB(A)60F4062X	DIODE	
	or S1WB(A)60F4072X	DIODE	
	or S1WB(A)4102	DIODE	
D908	1N4148M	DIODE	
	or 1SS133	DIODE	
D909	UZ27BSB	ZENER DIODE	
	or RD27ES-T1B2	ZENER DIODE	
	or MTZJ27(B)	ZENER DIODE	
D910	AU01	FR DIODE	
	or ERA18-04-T2	FR DIODE	
	or 1SR153-400-T2	FR DIODE	
	or 10ELS4	FR DIODE	
D911	AU01	FR DIODE	
	or ERA18-04-T2	FR DIODE	
	or 1SR153-400-T2	FR DIODE	
	or 10ELS4	FR DIODE	
D951	AU01Z	FR DIODE,J249EK	
	or 1SR153-200-T2	FR DIODE,J249EK	
	or 10ELS2	FR DIODE,J249EK	
	or ERA18-02-T2	FR DIODE,J249EK	
D952	RL2Z-LFB2	FR DIODE	
	or ERC30-02-L6	FR DIODE	
D953	RL2Z-LFB2	FR DIODE	
	or ERC30-02-L6	FR DIODE	
D955	RD15ES-T1B1	ZENER DIODE	
	or UZ15BSA	ZENER DIODE	
	or MTZJ15(A)	ZENER DIODE	
D956	21DQ04	BARRIER DIODE	
	or RK14LF-B2	BARRIER DIODE	
D958	RD30ES-T1B1	ZENER DIODE	
	or UZ30BSA	ZENER DIODE	
	or MTZJ30(A)	ZENER DIODE	
D960	1N4148M	DIODE	
	or 1SS133	DIODE	
D964	11ES2	DIODE,J249EK	
	or ERA15-02	DIODE,J249EK	
D965	AU01Z	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
	or ERA18-02-T2	FR DIODE	
D968	AU01Z	FR DIODE	
	or ERA18-02-T2	FR DIODE	
	or 10ELS2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
D969	AU01Z	FR DIODE	
	or ERA18-02-T2	FR DIODE	
	or 1SR153-200-T2	FR DIODE	
	or 10ELS2	FR DIODE	
D975	UZ6.8BSA	ZENER DIODE	
	or RD6.8ES-T1B1	ZENER DIODE	
	or MTZJ6.8(A)	ZENER DIODE	
D1001	MTZ10B	ZENER DIODE	
D1002	MTZJ33(C)	ZENER DIODE	
	or UZ33BSC	DIODE	
D1301	1N4148M	DIODE	
	or 1SS133	DIODE	
R1	QRD161J-562	RESISTOR	5.6kΩ,1/6W
R2	QRSA08J-162YN	RESISTOR	1.6kΩ,1/10W
R3	QRD161J-222	RESISTOR	2.2kΩ,1/6W
R4	QRSA08J-202YN	RESISTOR	2kΩ,1/10W
R5	QRSA08J-561YN	RESISTOR	560Ω,1/10W
R6	QRSA08J-821YN	RESISTOR	820Ω,1/10W
R7	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
R8	QRD161J-102	RESISTOR	1kΩ,1/6W
R9	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
R10	QRD161J-122	RESISTOR	1.2kΩ,1/6W
R11	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
R12	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
R13	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
R14	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	R15	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R16	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R17	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R18	QRSA08J-824YN	RESISTOR	820kΩ,1/10W
	R20	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
	R21	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R22	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R23	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
	R25	QRD161J-561	RESISTOR,J249EK	560Ω,1/6W
	R28	QRD161J-101	RESISTOR	100Ω,1/6W
	R29	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R31	QRSA08J-561YN	RESISTOR,J245EK	560Ω,1/10W
	R32	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R34	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R35	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R36	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R39	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R43	QRD161J-225	RESISTOR	2.2MΩ,1/6W
	R45	QRSA08J-395YN	RESISTOR	3.9MΩ,1/10W
	R46	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R47	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R50	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R52	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R53	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R57	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R58	QRD161J-183	RESISTOR	18kΩ,1/6W
	R59	QRD161J-153	RESISTOR	15kΩ,1/6W
	R65	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R66	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R67	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R101	QRSA08J-113YN	RESISTOR	11kΩ,1/10W
	R102	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R103	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R104	QRSA08J-162YN	RESISTOR	1.6kΩ,1/10W
	R105	QRSA08J-301YN	RESISTOR	300Ω,1/10W
	R107	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R109	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R201	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R202	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R203	QRD123J-331SX	RESISTOR	330Ω,1/2W
	R207	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R212	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R213	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R214	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R215	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R216	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R218	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R219	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R221	QRD161J-102	RESISTOR	1kΩ,1/6W
	R222	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R280	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R281	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R284	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R301	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R302	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R303	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R305	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R306	QRSA08J-121YN	RESISTOR	120Ω,1/10W
	R307	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R308	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R310	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R311	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R312	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R313	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R314	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R315	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R316	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R317	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R318	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R320	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R321	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R323	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R331	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R332	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
	R333	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R334	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
	R335	QRSA08J-3R3YN	RESISTOR	3.3Ω,1/10W
	R336	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R337	QRSA08J-820YN	RESISTOR	82Ω,1/10W
	R338	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R601	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R602	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R605	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R606	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R701	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R702	QRD161J-102	RESISTOR	1kΩ,1/6W
	R703	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R704	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R705	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R706	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R707	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R708	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R709	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R710	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R711	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R713	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R714	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R715	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R716	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R717	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R718	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R719	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R720	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R721	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R722	QRD161J-102	RESISTOR	1kΩ,1/6W
	R723	QRSA08J-102YN	RESISTOR,J249EK	1kΩ,1/10W
	R724	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R725	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R726	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R727	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R729	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R730	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R731	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R732	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R733	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R734	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R735	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R736	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R738	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R739	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R740	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R741	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R742	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R743	QRD161J-102	RESISTOR	1kΩ,1/6W
	R744	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R745	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R746	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R747	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R748	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R749	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R750	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R751	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R752	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R753	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R754	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R755	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R757	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R759	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R762	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R763	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R764	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R765	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R766	QRD161J-474	RESISTOR	470kΩ,1/6W
	R767	QRSA08J-334YN	RESISTOR	330kΩ,1/10W
	R769	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R770	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R771	QRD161J-104	RESISTOR	100kΩ,1/6W
	R772	QRD161J-152	RESISTOR	1.5kΩ,1/6W
	R774	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R775	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R776	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R777	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R778	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R779	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R780	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R781	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R782	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R783	QRD161J-102	RESISTOR	1kΩ,1/6W
	R784	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R785	QRSA08J-181YN	RESISTOR	180Ω,1/10W
	R786	QRD161J-750	RESISTOR	75Ω,1/6W
	R787	QRSA08J-181YN	RESISTOR	180Ω,1/10W
	R788	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R789	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	R794	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R800	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R801	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R802	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R803	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R804	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R805	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R806	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R807	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R809	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R810	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R814	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R815	QRD161J-103	RESISTOR	10kΩ,1/6W
	R816	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R817	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R818	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R821	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R901	QRD161J-224	RESISTOR	220kΩ,1/6W
	R902	QRD161J-224	RESISTOR	220kΩ,1/6W
	R903	QRD161J-683	RESISTOR	68kΩ,1/6W
	R904	QRD121J-331S	RESISTOR	330Ω,1/2W
	R905	QRX014J-R39Z	MF RESISTOR	0.39Ω,1W
	R906	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R908	QRG029J-683G	OMF RESISTOR	68kΩ,2W
	R909	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R910	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R911	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R951	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R955	QRG02DJ-222X	OMF RESISTOR	2.2kΩ,2W
⚠	R957	QRZ0077-101X	FUSIBLE RESISTOR	100Ω,1/4W
	R963	QRD161J-511	RESISTOR	510Ω,1/6W
	R964	QRD161J-471	RESISTOR	470Ω,1/6W
	R967	QRSA08J-472YN	RESISTOR,J249EK	4.7kΩ,1/10W
	R968	QRSA08J-222YN	RESISTOR,J249EK	2.2kΩ,1/10W
	R970	QRG01DJ-240X	OMF RESISTOR	24Ω,1W
	R973	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R974	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R975	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R1001	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R1002	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R1003	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R1004	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1012	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1016	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R1030	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1060	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1102	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R1103	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R1105	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R1106	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R1107	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R1108	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R1109	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R1111	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R1112	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R1113	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R1114	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1301	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1302	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	R1304	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R1307	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1308	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1309	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1310	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1313	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R1351	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R1352	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R1353	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R1354	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R1359	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R1360	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R1401	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
	R1402	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R1403	QRD123J-331SX	RESISTOR	330Ω,1/2W
	C1	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C2	QCTA1CH-680	CAPACITOR	68pF,16V
	C3	QCYA1EK-104	CAPACITOR	0.1μF,25V
	C4	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C5	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C6	QEKJ1CM-106	E CAPACITOR	10μF,16V

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C7	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C9	QERF0JM-107	E CAPACITOR	100µF,6.3V
	C10	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C11	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
	C12	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
	C13	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C14	QCTA1CH-221	CAPACITOR	220pF,16V
	C15	QCTA1CH-680	CAPACITOR	68pF,16V
	C16	QEKJ1HM-225	E CAPACITOR	2.2µF,50V
	C17	QEKJ1HM-474	E CAPACITOR	0.47µF,50V
	C18	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C19	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C20	QCYA1EK-333	CAPACITOR	0.033µF,25V
	C21	QCVB1CN-103	CAPACITOR,J245EK	0.01µF,16V
	C22	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C23	QEKJ0JM-107	E CAPACITOR	100µF,6.3V
	C24	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C25	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
	C26	QEPF1CM-106	NP E CAPACITOR	10µF,16V
	C28	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C29	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C30	QEKJ1HM-104	E CAPACITOR	0.1µF,50V
	C31	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C32	QEKJ1HM-335	E CAPACITOR	3.3µF,50V
	C34	QCYA1EK-473	CAPACITOR	0.047µF,25V
	C35	QCYA1CK-224	CAPACITOR	0.22µF,16V
	C36	QCTA1CH-390	CAPACITOR	39pF,16V
	C37	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C38	QCTA1CH-151	CAPACITOR	150pF,16V
	C39	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C41	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C42	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C43	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C44	QEKJ1CM-476	E CAPACITOR	47µF,16V
	C45	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C46	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C47	QCTA1CH-100	CAPACITOR	10pF,16V
	C48	QCYA1HK-183	CAPACITOR	0.018µF,50V
	C52	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C54	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C55	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C56	QCTA1CH-8R0	CAPACITOR,J245EK	8pF,16V
	C57	QCTA1CH-8R0	CAPACITOR,J249EK	8pF,16V
	C58	QCFA1HZ-103	CAPACITOR,J249EK	0.01µF,50V
	C60	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C61	QCTA1CH-5R0	CAPACITOR	5pF,16V
	C63	QCTA1CH-221	CAPACITOR	220pF,16V
	C64	QCTA1CH-101	CAPACITOR	100pF,16V
	C66	QCTA1CH-101	CAPACITOR	100pF,16V
	C75	QCTA1CH-330	CAPACITOR	33pF,16V
	C76	QCTA1CH-510	CAPACITOR	51pF,16V
	C101	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C102	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C103	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C104	QEKJ1CM-476	E CAPACITOR	47µF,16V
	C105	QCYA1EK-473	CAPACITOR	0.047µF,25V
	C106	QCYA1HK-272	CAPACITOR	0.0027µF,50V
	C107	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C110	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C111	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C112	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C113	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C114	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C117	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C118	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C120	QCTA1CH-331	CAPACITOR	330pF,16V
	C121	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C123	QCTA1CH-330	CAPACITOR	33pF,16V
	C124	QCTA1CH-330	CAPACITOR	33pF,16V
	C125	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C127	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C201	QETC1CM-476	E CAPACITOR	47µF,16V
	C202	QETC1CM-107	E CAPACITOR	100µF,16V
	C203	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C204	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C205	QETC0JM-477	E CAPACITOR	470µF,6.3V
	C217	QEKJ1HM-106	E CAPACITOR	10µF,50V
	C218	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
	C219	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C220	QCTA1CH-330	CAPACITOR	33pF,16V
	C271	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C301	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C302	QFLC1HJ-183Z	F CAPACITOR	0.018µF,50V
	C303	QFLC1HJ-223Z	F CAPACITOR	0.022µF,50V
	C306	QCYA1HK-222	CAPACITOR	0.0022µF,50V
	C307	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
	C308	QEKJ0JM-226	E CAPACITOR	22µF,6.3V
	C309	QCYA1HK-153	CAPACITOR	0.015µF,50V
	C310	QEKJ1EM-475	E CAPACITOR	4.7µF,25V
	C311	QCYA1EK-333	CAPACITOR	0.033µF,25V
	C312	QCYA1EK-333	CAPACITOR	0.033µF,25V
	C313	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C314	QCYA1HK-182	CAPACITOR	0.0018µF,50V
	C315	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C316	QCYA1EK-473	CAPACITOR	0.047µF,25V
	C317	QETC1CM-227	E CAPACITOR	220µF,16V
	C318	QCYA1HK-221	CAPACITOR	220pF,50V
	C331	QCYA1EK-223	CAPACITOR	0.022µF,25V
	C332	QCYA1HK-472	CAPACITOR	0.0047µF,50V
	C333	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C334	QCYA1HK-331	CAPACITOR	330pF,50V
	C335	QFLC1HJ-823Z	F CAPACITOR	0.082µF,50V
	C701	QAT3120-450Z	TRIM CAPACITOR,TIMER CLOCK	
	C702	QCTA1CH-180	CAPACITOR	18pF,16V
	C703	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C704	QEKA1CM-106	E CAPACITOR	10µF,16V
	C709	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C710	QCTA1CH-101	CAPACITOR	100pF,16V
	C711	QCTA1CH-101	CAPACITOR	100pF,16V
	C712	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C715	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C717	QEKJ1CM-336	E CAPACITOR	33µF,16V
	C719	QEZ0244-229	EDL CAPACITOR	0.0022F
	C730	QETC1HM-106	E CAPACITOR	10µF,50V
	C731	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C736	QCFA1EZ-104	CAPACITOR	0.1µF,25V
⚠	C901	QFZ9051-683	F CAPACITOR	0.068µF
⚠	C903	QFZ9022-333	F CAPACITOR	0.033µF
	C906	QETC1HM-105	E CAPACITOR	1µF,50V
	C907	QCZ0302-330Z	CAPACITOR	33pF
	C908	QFV21HJ-104AZ	F CAPACITOR	0.1µF,50V
	C910	PECA0738-686	E CAPACITOR	68µF
⚠	C911	QCZ9071-222	CAPACITOR	0.0022µF
	C915	QFLC1HJ-183Z	F CAPACITOR	0.018µF,50V
	C916	QCBB1HJ-271	CAPACITOR	270pF,50V
	C917	QCZ0212-472	CAPACITOR	0.0047µF,1kV
	C951	QEMU0JM-227	E CAPACITOR	220µF,6.3V
	C953	QEMT1AM-687	E CAPACITOR	680µF,10V
	C954	QEMT1CM-827	E CAPACITOR	820µF,16V
	C955	QEMU1EM-187	E CAPACITOR,J249EK	180µF,25V
	C959	QETC1JM-226	E CAPACITOR	22µF,63V
	C960	QETC1HM-226	E CAPACITOR	22µF,50V
	C961	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C963	QETC0JM-227	E CAPACITOR	220µF,6.3V
	C964	QETC1CM-226	E CAPACITOR	22µF,16V
	C965	QETC1AM-107	E CAPACITOR	100µF,10V
	C966	QETC1HM-106	E CAPACITOR	10µF,50V
	C967	QETC1CM-107	E CAPACITOR	100µF,16V
	C971	QETC1AM-227	E CAPACITOR	220µF,10V
	C972	QETC1CM-227	E CAPACITOR	220µF,16V
	C973	QFLC1HJ-183Z	F CAPACITOR	0.018µF,50V
	C1001	QETC1CM-336	E CAPACITOR	33µF,16V
	C1002	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1003	QETC1HM-106	E CAPACITOR	10µF,50V
	C1004	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1008	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1101	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1103	QCYA1EK-563	CAPACITOR	0.056µF,25V
	C1104	QCTA1CH-101	CAPACITOR	100pF,16V
	C1106	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C1107	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1108	QCTA1CH-470	CAPACITOR	47pF,16V
	C1109	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1110	QCYA1HK-222	CAPACITOR	0.0022µF,50V
	C1111	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C1113	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C1114	QEKJ1CM-106	E CAPACITOR	10µF,16V
	C1115	QEKJ0JM-107	E CAPACITOR	100µF,6.3V
	C1116	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C1117	QCFA1CZ-105	CAPACITOR	1µF,16V
	C1301	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C1303	QEKJ1HM-105	E CAPACITOR	1µF,50V
	C1305	QEKJ0JM-227	E CAPACITOR	220µF,6.3V
	C1306	QCYA1CK-224	CAPACITOR	0.22µF,16V
	C1307	QCTA1CH-150	CAPACITOR	15pF,16V
	C1312	QCYA1CK-224	CAPACITOR	0.22µF,16V
	C1351	QEKJ1CM-226	E CAPACITOR	22µF,16V
	C1352	QCYA1EK-563	CAPACITOR	0.056µF,25V
	C1353	QCYA1CK-224	CAPACITOR	0.22µF,16V
	C1354	QCTA1CH-102	CAPACITOR	0.001µF,16V
	C1401	QCYA1HK-681	CAPACITOR	680pF,50V
	C1402	QCYA1HK-681	CAPACITOR	680pF,50V
	C1403	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1404	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C1405	QCYA1HK-102	CAPACITOR	0.001µF,50V
	C1406	QCTA1CH-101	CAPACITOR	100pF,16V
	C1407	QCYA1HK-681	CAPACITOR	680pF,50V
	C1408	QCYA1HK-681	CAPACITOR	680pF,50V
	C1410	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	C1412	QCTA1CH-101	CAPACITOR	100pF,16V
	L1	QQL29BJ-100Z	COIL	10µH
	L2	PELN1203	COIL	
	L3	PU59152-5R6J	COIL	5.6µH
	L4	QQL29BJ-100Z	COIL	10µH
	L5	PU59152-820J	COIL	82µH
	L6	QQL29BJ-100Z	COIL	10µH
	L8	PU59152-181J	COIL	180µH
	L9	PU59152-820J	COIL,J245EK	82µH
	L10	QQL29BJ-221Z	COIL	220µH
	L11	QQL29BJ-331Z	COIL	330µH
	L13	PU59152-820J	COIL,J249EK	82µH
	L15	PU59152-1R0J	COIL	1µH
	L16	PU59152-R56J	COIL	0.56µH
	L101	QQL29BJ-100Z	COIL	10µH
	L201	QQL29BJ-101Z	COIL	100µH
	L208	QQL29BK-1R0Z	COIL	1µH
	L301	PU58308-123J	COIL	12mH
	L703	QQL29BJ-100Z	COIL	10µH
	L951	PELN1184	COIL	
	L953	PELN1184	COIL	
	L954	QQL29BJ-151Z	COIL	15µH
	L1002	PU59152-R22J	COIL	0.22µH
	L1003	QQL29BK-1R0Z	COIL	1µH
	L1004	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1081	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1101	PU59152-270J	COIL	27µH
	L1301	QQL29BK-1R0Z	COIL	1µH
	L1305	QQL29BJ-330Z	COIL	33µH
	L1401	PU59152-4R7J	COIL	4.7µH
	L1402	PU59152-4R7J	COIL	4.7µH
	L1405	QQL29BJ-6R8Z	COIL	6.8µH
	L1406	PU59152-4R7J	COIL	4.7µH
	L1407	PU59152-4R7J	COIL	4.7µH
	L1411	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1412	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1413	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1414	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	L1415	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
⚠	CF701	PEVB0594-Z	RESONATOR	
⚠	X1	PEVB0658	CRYSTAL RESONATOR	
⚠	X701	PEVB0422	CRYSTAL RESONATOR	
	K901	PELN0662-Z	FERRATE BEADS	
⚠	PC901	PC123F2	PH COUPLER	
	PS701	SG-246	IC(PHOTO SENSOR	
	PS702	SG-246	IC(PHOTO SENSOR	
⚠	T301	PELN0832	OSC TRANSFORMER	
⚠	T901	QQS0011-001	SW TRANSFORMER	
⚠	BK1	PQ21944-1-2	TRANS BRACKET	
	ET1	PQ46601	EARTH PLATE	
⚠	HS1	PQ45788-1-2	HEAT SINK	
	W1	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W2	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W3	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W4	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W5	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W6	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W7	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W9	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W10	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W11	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W14	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W15	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W16	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W17	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	W18	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W19	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W21	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W22	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W23	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W24	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W25	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W26	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
⚠	FC901	PEMC0965-Z	FUSE CLIP,F901	
⚠	FC902	PEMC0965-Z	FUSE CLIP,F901	
⚠	LF901	PELN1204	LINE FILTER	
⚠	LF902	QQR0608-001	LINE FILTER	
	J1401	PEMC1104	RGB21PIN SOCKET,PERI 1	
	J1402	PEMC1104	RGB21PIN SOCKET,PERI 2	
	TB1	LP30134-002B	TERMINAL BOARD ASSEMBLY	
	EH1	PQ21623-1-2	EARTH PLATE(RF)	
	OH1	SDSF3008Z	SCREW,X2 TERMINAL BOARD	
	OH2	SDST3006Z	SCREW,HEAT SINK	
	SD1	LP30132-001A	SHIELD CASE	
	SD2	LP30133-001A	SHIELD PLATE	
	TU1001	QAU0011-001	TUNER	
	UN1001	QAU0027-001	IF UNIT	
	CN101	PEMC1163-004A	CONNECTOR,(3-6) UPPER DRUM	
	CN301	PU60727-7	CONNECTOR,(1-7)A/C HEAD	
	CN302	PU60727-2	CONNECTOR,(1-2)FE HEAD	
	CN701	PEMC1077	CONNECTOR,(1-8)CAP MDA	
	CN702	PU61434-1-1	CONNECTOR,(1-5)ROTARY ENCODER	
	CN703	PU60910-2	CONNECTOR,(1-2)LOADING MOTOR	
	CN705	PEMC1101-008	CONNECTOR,(1-8)JOG/SHUTTLE J249EK	
	CN802	PEMC1101-012	CONNECTOR,(1-12)DISPLAY	
⚠	CN901	PU60250-2	CONNECTOR,(1-2)AC HEAD	
	CN1102	PEMC1101-004	CONNECTOR,(1-4)DRUM MOTOR	
⚠	CP701	ICP-N25	CIRCUIT PROTECTOR	
⚠	CP901	ICP-N25	CIRCUIT PROTECTOR	
⚠	CP902	ICP-N25	CIRCUIT PROTECTOR	
⚠	CP1101	ICP-N15	CIRCUIT PROTECTOR	
⚠	F901	QMF51E2-1R25J1	FUSE	T1.2A

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AUDIO/CONTROL HEAD BOARD ASSY <12>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW1	PB10916A-04	A/CTL HEAD BOARD ASSEMBLY	
	CN1	PU60910-107	CONNECTOR,(1-7)MAIN	

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DISPLAY BOARD ASSEMBLY <28>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW1	PB11047F1-01	DISPLAY BOARD ASSEMBLY,J249EK	
		PB11047G1-01	DISPLAY BOARD ASSEMBLY,J245EK	
⚠	IC1201	UPD16312GB(P)	IC	
⚠		or UPD16312GB(M)	IC	
	IC1202	GP1U281X	IR DETECT UNIT	
		or PIC-21143TE5	IR DETECT UNIT	
		or PNA4652M00XB	IR DETECT UNIT	
	D1201	1N4148M	DIODE	
		or 1SS133	DIODE	
	D1202	1N4148M	DIODE	
		or 1SS133	DIODE	
	D1203	1N4148M	DIODE	
		or 1SS133	DIODE	
	D1204	1N4148M	DIODE	
		or 1SS133	DIODE	
	D1207	RD9.1ES-T1B2	ZENER DIODE	
⚠	D1208	SLR-342MC3F	LE DIODE,AUDIO SPLP J249EK	
⚠	D1209	SLR-342DC3F	LE DIODE,TRI-R J249EK	
	D1220	1N4148M	DIODE,J249EK	
		or 1SS133	DIODE,J249EK	
	D1230	11ES2	DIODE	
	R1201	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1202	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1203	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1204	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1205	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R1206	QRD161J-102	RESISTOR	1kΩ,1/6W
	R1207	QRD161J-471	RESISTOR	470Ω,1/6W
	R1208	QRD161J-563	RESISTOR	56kΩ,1/6W
	R1209	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1210	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1211	QRD161J-103	RESISTOR	10kΩ,1/6W
	R1212	QRD161J-472	RESISTOR	4.7kΩ,1/6W
⚠	R1217	QRD161J-331	RESISTOR,J249EK	330Ω,1/6W
⚠	R1218	QRD161J-331	RESISTOR,J249EK	330Ω,1/6W
	R1221	QRD161J-333	RESISTOR	33kΩ,1/6W
	R1222	QRD161J-333	RESISTOR	33kΩ,1/6W
	R1223	QRD161J-333	RESISTOR	33kΩ,1/6W
	R1224	QRD161J-333	RESISTOR	33kΩ,1/6W
	C1201	QETC1CM-476	E CAPACITOR	47µF,16V
	C1202	QCFB1HZ-104	CAPACITOR	0.1µF,50V
	C1203	QEKC0JM-227	E CAPACITOR	220µF,6.3V
	C1204	QCSB1HJ-470	CAPACITOR	47pF,50V
	C1205	QCSB1HJ-330	CAPACITOR	33pF,50V
	C1206	QEKC1HM-106	E CAPACITOR	10µF,50V
	C1207	QCBB1HJ-102	CAPACITOR	0.001µF,50V
	L1201	QQL29BJ-331Z	COIL	330µH
	S1201	PESW0525-02Z	TACT SWITCH,TV PROG+	
	S1202	PESW0525-02Z	TACT SWITCH,TV PROG-	
	S1203	PESW0525-02Z	TACT SWITCH,POWER	
	S1204	PESW0525-02Z	TACT SWITCH,TIMER	
	S1205	PESW0525-02Z	TACT SWITCH,C.RESET	
	S1206	PESW0525-02Z	TACT SWITCH,TRI-R J249EK	
	S1207	PESW0525-02Z	TACT SWITCH,RE-VIEW	
	S1208	PESW0525-02Z	TACT SWITCH,AUTO SPLP J249EK	
	S1209	PESW0525-02Z	TACT SWITCH,REC	
	S1210	PESW0525-02Z	TACT SWITCH,PAUSE	
	S1211	PESW0525-02Z	TACT SWITCH,SP/LP	
	S1212	PESW0525-02Z	TACT SWITCH,STOP/EJECT J249EK	
	S1213	PESW0525-02Z	TACT SWITCH,S1213/18 J249EK	
	S1218	PESW0525-02Z	TACT SWITCH,S1213/18 J245EK	
	S1219	PESW0525-02Z	TACT SWITCH,S1212/19 J245EK	
	HD1	LP30140-001A	FDP HOLDER L,DI1201	
	HD2	LP30141-001A	FDP HOLDER R,DI1201	
	HD3	PQM30038-6	LED HOLDER,X2 D1208 D1209 J249EK	
	FW1201	PW30101-60AA442	PARALLEL WIRE,REC SAFETY	
	FW1202	PW30101-60AA442	PARALLEL WIRE,CASSETTE SW	
	CN1201	PEMC1101-112	CONNECTOR(1-12)MAIN	
	CN1203	PEMC1101-006	CONNECTOR,(1-6)JOG/SW J245EK	

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REC SAFETY BOARD ASSEMBLY <32>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW3	PB11047A3	REC SAFETY BOARD ASSEMBLY	
	S1241	PESW0589	PUSH SWITCH	

* * *

CASSETTE SWITCH BOARD ASSEMBLY <33>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW4	PB11047A4-01	CASSETTE SWITCH BOARD ASSEMBL	
	S1242	PU61320	PUSH SWITCH	

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JOG/SW BOARD ASSEMBLY <37>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW2	PB11047D2-01	JOG/SW BOARD ASSEMBLY,J245EK	
		PB11047A2-01	JOG/SW BOARD ASSEMBLY,J249EK	
	S1214	PESW0525-02Z	TACT SWITCH,INDEX- J245EK	
	S1215	PESW0525-02Z	TACT SWITCH,INDEX+ J245EK	
	S1216	PESW0525-02Z	TACT SWITCH,PLAY J245EK	
	S1217	PESW0525-02Z	TACT SWITCH,STOP/EJECT J245EK	
	UN1291	PEME0786-02	JOG SHUTTLE ASSEMBLY	
	CN1204	PEMC1101-106	CONNECTOR,(1-6)DISPLAY J245EK	
	CN1205	PEMC1101-108	CONNECTOR,(1-8)MAIN J249EK	

* * *

TRI-R BOARD ASSEMBLY(HR-J249EK) <39>

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	PW1	PB11049A-01	TRI-R BOARD ASSEMBLY	
	IC3001	JCP0065	IC	
	Q3001	DTC124EU	TRANSISTOR	
	R3001	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R3002	QRSA08J-475YN	RESISTOR	4.7MΩ,1/10W
	R3003	QRSA08J-274YN	RESISTOR	270kΩ,1/10W
	R3004	QRSA08J-564YN	RESISTOR	560kΩ,1/10W
	R3005	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R3006	QRD161J-184	RESISTOR	180kΩ,1/6W
	R3007	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R3008	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R3009	QRSA08J-155YN	RESISTOR	1.5MΩ,1/10W
	C3001	QCTA1CH-221	CAPACITOR	220pF,16V
	C3003	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3004	QCTA1CH-221	CAPACITOR	220pF,16V
	C3005	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3006	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C3007	QCSB1HJ-220	CAPACITOR	22pF,50V
	C3008	QCFA1HZ-103	CAPACITOR	0.01µF,50V
	C3009	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3010	QCTA1CH-331	CAPACITOR	330pF,16V
	C3011	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3012	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3013	QETC1CM-476	E CAPACITOR	47µF,16V
	C3014	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3015	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3016	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3017	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3018	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3019	QCYA1EK-104	CAPACITOR	0.1µF,25V
	C3020	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3021	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3022	QCYA1HK-103	CAPACITOR	0.01µF,50V
	C3023	QCYA1CK-474	CAPACITOR	0.47µF,16V
	C3024	QCYA1CK-474	CAPACITOR	0.47µF,16V
	C3025	QCTA1CH-391	CAPACITOR	390pF,16V
	C3031	QETC1HM-105	E CAPACITOR	1µF,50V
	W3011	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	W3012	QRSA08J-0R0Y	RESISTOR	0Ω,1/10W
	CN3001	PEMC0712-110	PIN HEADER	

SECTION 6
TECHNICAL INFORMATION

6.1 SYSCON CIRCUIT

6.1.1 Syscon CPU pin function (IC701) 1/2

PIN NO	LABEL	IN/OUT	NOTE
1	PROTECT	IN	SWD5V/12V DETECT
2	MESECAM DET	-	NC
3	LOCK DET	IN	TUNING LOCK CHECK
4	SCURVE	IN	TUNING CHECK
5	AVSS	-	GND
6	TEST	-	GND
7	X2	-	TIMER CLOCK (32.768 kHz)
8	X1	-	TIMER CLOCK (32.768 kHz)
9	VSS	-	GND
10	OSC1	-	SYSTEM CLOCK (10 MHz)
11	OSC2	-	SYSTEM CLOCK (10 MHz)
12	RESET (L)	-	RESET AT CONNECT VCR TO AC
13	(MNI)	-	NC
14	R. PAUSE	-	NC
15	STTS	IN	LEADER TAPE DETECT (DETECT ON: L)
16	LSC	IN	MECHANISM MODE DETECT (C)
17	LSB	IN	MECHANISM MODE DETECT (B)
18	LSA	IN	MECHANISM MODE DETECT (A)
19	C.L.END	IN	CASSETTE TAPE LOAD SWITCH (CASSETTE IN: L)
20	RECSF	IN	REC SAFETY SWITCH DETECT (SW ON: L)
21	ENDS	IN	TRAILER TAPE DETECT (DETECT ON: L)
22	TU FG	IN	TAKE-UP REEL ROTATION DET/TAPE REMAIN
23	SUP FG	IN	SUPPLY REEL ROTATION DET/TAPE REMAIN
24	SHUTTLE (L)	IN	SHUTTLE SWITCH (SHUTTLE ON: L)
25	JSB	IN	JOG DIAL PULSE INPUT (B)
26	JSA	IN	JOG DIAL PULSE INPUT (A)
27	PLL DATA	OUT	TUNING IC DATA
28	PLL-CE	OUT	TUNING IC DATA CHIP ENABLE
29	TU CTL (H)	OUT	TUNER ON/OFF CONTROL (TUNER ON: H)
30	A. MUTE	OUT	AUDIO MUTE CONTROL (MUTE ON: H)
31	P. CTL (H)	OUT	POWER ON/OFF CONTROL (POWER ON: H)
32	V. APT ON	OUT	VIDEO APERTURE CONTROL ON
33	COL CTL	OUT	REC COLOUR CONTROL
34	FRONT (H)	OUT	INPUT SELECT (FRONT: H, REAR: L)
35	P. MUTE (L)	OUT	PICTURE MUTE CONTROL (MUTE ON: L)
36	DUTY I/O	IN/OUT	IN/OUT INDEX DATA CONTROL
37	B/W (H)	OUT	BLACK/WHITE SWITCH DETECT
38	REC ST (H)	OUT	REC START: H
39	EE (L)	OUT	EE MODE: L
40	DAV	-	NC

Table 6-1-1 SYSCON CPU pin function(1/2)

6.1.2 Syscon CPU pin function (IC701) 2/2

PIN NO	LABEL	IN/OUT	NOTE
41	PB SPE (L)	OUT	PB SPECIAL ON: L
42	DOC OFF (L)	-	NC
43	I2C CLK	OUT	CH+ DATA TRANSFER CLOCK
44	I2C DATA	IN/OUT	CH+ IIL LOGIC CONTROL DATA
45	VPCTL	OUT	V. PULSE ADDITION TIMING CONTROL
46	PERI2(L)	OUT	PREI CONNECTOR SELECT (AV1: H, AV2: L)
47	V UP (H)	OUT	CAPSTAN MOTOR VOLTAGE UP
48	SP (L)	OUT	SP MODE: L
49	BEST (L)	OUT	BEST SYSTEM ON: L
50	RCIN	IN	REMOTE CONTROL DATA INPUT
51	NREC (H)	OUT	REC CONTROL ON: H
52	CTL C/D	IN	CTL PULSE INPUT (MODE DETECT/BLANK PORTION DETECT)
53	COMB OFF (H)	OUT	COMB FILTER ON/OFF CONTROL (OFF: H)
54	CAP-REV	OUT	CAPSTAN MOTOR CONTROL (FWD: H/REV: L)
55	OSD CS	-	NC
56	COM-CLOCK	OUT	MEMORY IC DATA TRANSFER CLOCK
57	S-OUT	OUT	SERIAL DATA OUTPUT
58	S-IN	IN	SERIAL DATA INPUT
59	S-CLK	OUT	SERIAL DATA TRANSFER CLOCK
60	H. DATA	OUT	VIDEO IC CONTROL DATA
61	STB	OUT	CLOCK OUTPUT PERMISSION
62	H. CLK	OUT	VIDEO IC DATA TRANSFER CLOCK
63	VCC	-	SYSTEM POWER
64	S-DATA	OUT	SERVO IC CONTROL DATA
65	LCM3	OUT	LOADING MOTOR DRIVE (3)
66	PAUSE	OUT	CAPSTAN MOTOR CONTROL (PAUSE: L)
67	CTL CLOCK	IN	INDEX CONTROL
68	LCM2	OUT	LOADING MOTOR DRIVE (2)
69	CAP FG	IN	TAPE SPEED DETECT/BACK SPACE COUNT
70	LCM1	OUT	LOADING MOTOR DRIVE (1)
71	D. FF	IN	DRUM ROTATION DETECT/ REC TIMING CONTROL
72	AVCC	-	SYSTEM POWER (FOR ANALOG)
73	AVRG FM	IN	AUTO TRACKING DATA (AVRG VOLTAGE OF PB LEVEL INPUT)
74	6.5H DET	IN	PB SWITCHING POINT ADJUST PULSE
75	DRUM V	OUT	DRUM MOTOR CONTROL
76	CAP V	OUT	CAPSTAN MOTOR CONTROL
77	SCR IN	-	NC
78	SYNC DET	IN	SYNC DETECT (NO SYNC: H)
79	IF AGC	IN	IF AGC DETECT
80	P. DOWN	IN	POWER DOWN DETECT (POWER DOWN: H to L)

Table 6-1-2 SYSCON CPU pin function(1/2)